THE

JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

[Registered as a Newspaper.]

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GAS PURIFICATION
BY
OXIDE OF IRON.

COOKE BROS.,
CENTRAL DEPÔTS:
CO. DONEGAL, IRELAND;
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GENUINE TORBAY PAINT
And SPECIAL GASOMETER PAINT.
Several Prize Medals. Established over 20 Years.
These Paints are now used in over 200 Country Gas-Works, and by all the London Gas Companies, on Gasholders, Scrubbers, Purifiers, &c. Also used by the Admiralty, War Office, Railway Companies, Founders, &c. They prevent and arrest rust, and protect iron from the action of water, sulphurous and gaseous exhalations; do not crack, blister, or flake off; will cover tar effectually.
The covering powers are considerably greater than those of any other Paint.—*See "Engineer," Nov. 2, 1866.*
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CONTRACTOR FOR
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FOR
Gas, Water, & Sanitary Purposes,
AND MANUFACTURER OF
WOOD GRIDS
FOR
SCRUBBERS AND PURIFIERS.

COWEN'S PATENT FIRE-CLAY RETORTS.
JOSEPH COWEN and CO.,
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Were the only parties to whom a Prize Medal was awarded at the Great Exhibition of 1851, for "Gas-Retorts and other Objects in Fire-Clay," and they were also awarded at the International Exhibition of 1862, the Prize Medal for "Gas-Retorts, Fire-Bricks, &c., for Excellence of Quality."
J. C. and Co. have been for many years the most extensive Manufacturers of Fire-Clay Retorts and Fire-Bricks in the Kingdom. Orders for Fire-Clay Retorts of all shapes and dimensions, and to fit any shaped Mouthpiece, Fire-Bricks, and every other article in Fire-Clay, are promptly executed at their Works as above.
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Jos. Cowen & Co. are the only Manufacturers of Fire-Bricks and Clay Retorts at Blaydon Burn.

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THREE PRIZE MEDALS,
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WET AND DRY GAS-METERS,
Licensees and Manufacturers of
HUNT'S
PATENT COMPENSATING METERS,
STREET-LAMPS, &c., &c.
Established 1830.

THOMAS PIGGOTT & CO.,
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Manufacturers of
TELESCOPIC & SINGLE GASHOLDERS,
CAST & WROUGHT IRON TANKS FOR DITTO,
And Gas Apparatus of every Description.
Marine, Tubular, Cornish, Plain, Furnace, Saddle, and Range Boilers.
Sugar, Saltpetre, and all kinds of Pans.
Roofs, Girders, and Bridges, and General Smith's Work.
London Offices: 97, CANNON STREET—
JAMES E. & SAMUEL SPENCER, Agents.

THE
"OTTO" GAS-ENGINE.
See Page 350.

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LESMAHAGOW
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Manufacturers of

IMPROVED CONSUMERS WET GAS-METERS

IN CAST-IRON CASES,

THE UNVARYING WATER-LINE GAS-METER,

AND

IMPROVED DRY GAS-METERS;

STATION-METERS OF ALL SIZES, with PLANED JOINTS;

GOVERNORS, PRESSURE AND EXHAUST REGISTERS, TEST HOLDERS.

And all kinds of Experimental Gas Apparatus.

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SIZES: ¾ to 12 inches at GLASGOW.

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A LARGE STOCK KEPT, AND PRICES MODERATE.

Freight to London, in the Stream, 10s. per ton from Stockton; 15s. from Glasgow.

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HYDRATED PURIFYING MATERIAL.

Samples on application.

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Will be glad to supply the above on the most favourable terms, and to treat, by Purchase or Exchange, for Spent Oxide.

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IMPROVED HYDRAULIC CRANES,

Effecting a great saving in the cost of discharging Coals from Vessels, Barges, &c. Several of these Cranes, with the necessary power, are now being erected at the Beckton Gas-Works.

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HYDRAULIC APPARATUS for Lifting and Lowering Purifier-Covers.

Sixteen recently erected at Beckton, applied to Covers 30 feet square.

GAS AND WATER PIPES, ROOFING, BOILERS, &c.

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IN SUCCESSFUL OPERATION AT THE NEW WORKS OF THE NEWCASTLE AND GATESHEAD GAS COMPANY.

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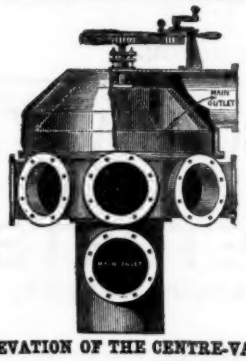
C. & W. WALKERS'
PATENT CENTRE-VALVES.



ELEVATION OF THE CENTRE-VALVE.

PLAN OF THE VALVE.

PLAN OF THE BODY.

These PATENT CENTRE-VALVES are the most perfect and certain means for working Purifiers on the system of three in action, and one out of action. The Valve itself is protected from all injury inside the safety cover. The working of the Valve is so easy, and so governed by the stop-catch movement, that the Purifiers can be instantaneously changed in the dark as well as in daylight. They are scraped perfectly true, metal to metal, the facings heretofore exposed are always covered, and there is nothing more reliable, certain, and durable in a gas-works. By their use the floor of the Purifying-house is clear and level; the Valve and all connexions being beneath the floor, out of the way of working. A considerable improvement and saving is effected in the cost of the connecting-pipes.

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WILLEY & COMPANY,

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INVITE THE ATTENTION OF GAS COMPANIES AND OTHERS FOR THE SUPPLY OF

EVERY DESCRIPTION OF GAS APPARATUS.

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NEW GAS-WORKS erected complete. Plans and Estimates furnished. MAINS, METERS, SERVICES, LAMPS, &c., adapted for Towns of any size. Gas Companies advised on Improvements, Extensions, and Alterations of Works.

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An extensive variety of Choice Designs in CHANDELIERS, PENDANTS, BRACKETS, STAR and SUN LIGHTS, MEDIÆVAL FITTINGS for CHURCHES, &c.

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PALMERSTON BUILDINGS, OLD BROAD STREET, LONDON, E.C.

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THORNCLIFFE IRON-WORKS, NEAR SHEFFIELD,

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PURIFIERS, CONDENSERS, SCRUBBERS, GASHOLDERS, ROOFS,

And every description of Gas Machinery.

TENDERS GIVEN FOR WORK FIXED COMPLETE IN ANY PART OF THE KINGDOM.

WEST'S GAS IMPROVEMENT COMPANY,

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ARE NOW PREPARED TO SUPPLY AND ERECT THEIR PATENTED MACHINERY FOR

CHARGING AND DRAWING GAS-RETORTS,

And to enter into arrangements with GAS COMPANIES for its use upon moderate terms of Royalty.

The Patented Machinery has secured the approbation of all Engineers who have visited the MAIDSTONE GAS-WORKS, *where it is in full operation, and may be inspected at any time on application to the Manager.*

The advantages attending its use are—

INCREASED VOLUME OF GAS PER TON.—INCREASED YIELD PER RETORT.—INCREASED BULK OF COKE FOR SALE.—REDUCTION IN LABOUR AND LESS DEPENDENCE ON SKILLED STOKERS.

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MANUFACTURERS OF ALL DESCRIPTIONS OF

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THE ORIGINAL PATENTEES AND MANUFACTURERS OF THE

DRY-FACED VALVES

FOR PURIFIERS, GASHOLDERS, BYE-PASS, AND OTHER ARRANGEMENTS REQUIRING VALVES IN GAS-WORKS.

The Faced Valves, as made by the Patentees, continue to give great satisfaction, and they are being used extensively by many of the best gas engineers of the day.

They are more easily repaired than any other kind of Valve in use, and can be re-ground in a few hours without removal, and made perfectly gas-tight.

References can be given to many Engineers of high standing, who will testify as to the favour in which they are held.

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LAMP-METERS IN CAST-IRON BOXES,

And every Description of Gas Apparatus.

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MANUFACTURERS OF

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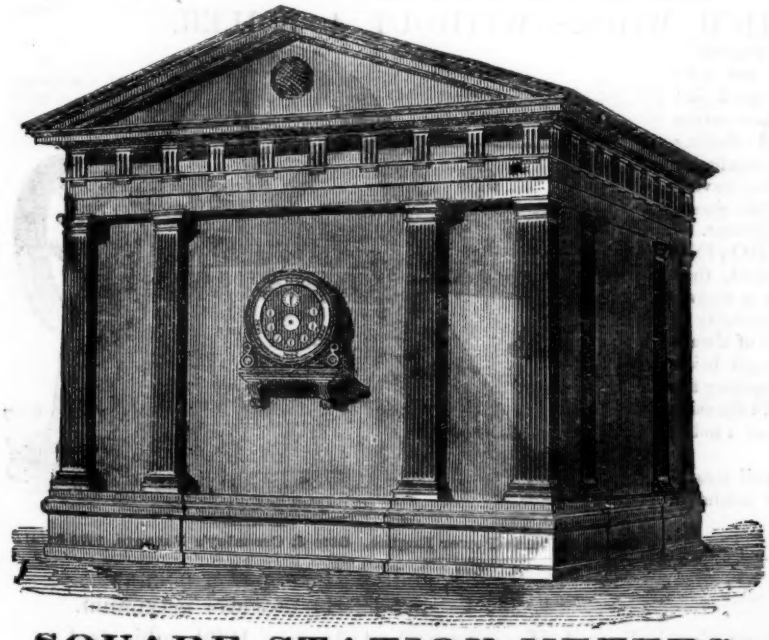
OF THE HIGHEST EXCELLENCE ONLY;

ALSO LICENSEES AND MANUFACTURERS OF

WARNER & COWAN'S PATENT SELF-REGULATING GAS-METERS;

ROUND STATION-METERS,

ON CAST-IRON STANDS.



SQUARE STATION-METERS,

WITH PLANED JOINTS.

GOVERNORS, GAUGES, INDICATORS, MAIN COCKS, &c.

GAS COOKING APPARATUS.

Home and Foreign Orders promptly attended to.

All Sizes of CONSUMERS METERS, STATION-METERS, and GOVERNORS generally in Stock.

Orders almost invariably despatched on the day of receipt.

TERMS, &c. ON APPLICATION.

C. & W. WALKER'S

WOOD PURIFIER SIEVES,

Which have now been used for fifteen years, and their advantages and durability fully established. They are made entirely by steam machinery in very large quantities at the most moderate cost.

MIDLAND IRON-WORKS,

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ESTABLISHED IN 1800.

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FOR

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Manufacturers for Home and Export.

GAS-RETORTS, GLASS-HOUSE FURNACE,

BLAST-FURNACE, TANK BRICKS, LUMPS, TILES,

And Every Description of Best Fire-Bricks.

JOHN ROMANS, C.E., F.G.S.E.,

CONSULTING GAS ENGINEER

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CANNEL COAL FACTOR,

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Plans and Estimates furnished; Gas-Works, Apparatus, Pipes, Machinery, Fire Goods, &c., supplied, or Attested and Shipped for Exportation.

GAS-WORKS TAKEN ON LEASE.

Mr. ROMANS has for upwards of 30 years been practically engaged in the Manufacture of Gas, and has, by extensive experiments, ascertained that by JUDICIOUS INTERMIXTURE of the lighter with the heavier gases, much of the rich Hydrocarbons CAN BE SAVED, which otherwise ARE LOST, during the process of manufacture. He is therefore enabled to give advice to those who favour him with their orders for Cannel, as to the class which will secure for their standard of illuminating power the HIGHEST ADVANTAGEOUS RESULTS.

ANALYSIS AND PRICES FORWARDED ON APPLICATION.

GRIRDROD'S PATENT

PORTABLE PIPE SCREWING MACHINE,

For 1 in., 1¼ in., 1½ in., and 2 in. Gas Threads, complete £7 10s.

In use at the chief gas-works, and giving great satisfaction.

For other useful goods, see Bailey's "Illustrated Inventions," post free 3s. 6d.; gratis to ledger customers.

W. H. BAILEY & CO.,

Brassfounders, Gauge Injector and Tool Makers,

ALBION WORKS, SALFORD,

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Gold Medal Awarded, Paris Exhibition, 1878.

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SHEAF AND SPRING WORKS,

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FOR ENGINEERS,

STEEL OF ALL DESCRIPTIONS,

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RATCHET BRACES, LIFTING-JACKS,

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The following Medals have been awarded:—

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The only Gold Medal awarded for "Apparatus and Processes for Heating and Lighting" by the Imperial Commissioners.

MEDAL FOR PROGRESS, VIENNA, 1873.

The following Medals were also awarded at Paris, 1878:—

GOLD MEDAL for Chandeliers and Gas-Fittings.

GOLD MEDAL (Rappel) for Metallic Bedsteads and Furniture.

GOLD MEDAL (Rappel) for Art Metal Work. BRONZE MEDAL for Tube Metal and Wire.

MANUFACTURERS OF BRASS AND COPPER SHEETS,

TUBE AND WIRE,

ROLLED METALS, LOCOMOTIVE AND CONDENSER TUBES, CYLINDERS;

Ornamental, Taper, and Cased Tubes; Tin Tubes;

GAS-FITTINGS, CHANDELIERS,

BRACKETS FOR HEATING AND LIGHTING;

METALLIC BEDSTEADS.

Ecclesiastical and Mediæval Metal Workers.

GENERAL BRASSFOUNDERS.

REGISTERED TRADE MARK:

R. W. W. & CO.

LONDON OFFICES & SHOW-ROOMS: 141, FLEET STREET, E.C.

THE

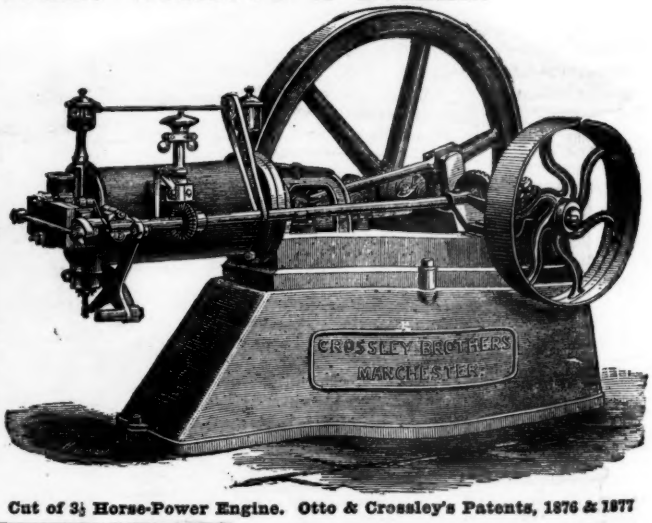
New "OTTO" Silent Gas-Engine.

AN ENGINE WHICH WORKS WITHOUT A BOILER.

The principle of combustion in this Gas-Engine is ENTIRELY NEW. In it an explosion does not take place in the ordinary meaning of the term. A small part only of the charge is combustible, which on ignition serves to expand the remainder, thus avoiding shock and effecting great economy. The Engine is also alone in the peculiarity of igniting its charge at the *beginning* of the stroke, leaving the whole of the stroke for effecting expansion of the gases, instead of merely a fraction as in obsolete constructions.

This Engine has a SMALLER NUMBER of MOVING PARTS than any other Gas-Engine; or, indeed, than many steam-engines. It is almost as silent as a steam-engine, works with the same smoothness and regularity of speed, and has the immense additional advantages of always being ready to start at full power at once on the gas being lighted; and, by dispensing with the boiler, of avoiding the danger of explosion, increased rates for insurance, expensive attendance, and all the annoyance which the use of a boiler entails.

Where work is intermittent, trouble with a small steam-engine and boiler is at its maximum, but at its minimum with a Gas-Engine.



Cut of 3½ Horse-Power Engine. Otto & Crossley's Patents, 1876 & 1877

Sizes at present offered . . . . . 1, 2, 3½, and 8 Horse-power nominal.
Being equal to about . . . . . 1½, 2½, 4, and 12 Horse-power maximum.

Cost of Gas, One Penny per hour per indicated Horse-power, at 4s. per 1000 cubic feet.

PRICES, LIST OF USERS, AND BOOK OF SEVENTY TESTIMONIALS, ETC., ON APPLICATION TO

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LONDON WAREHOUSE: 116, QUEEN VICTORIA STREET, E.C.

SOLE ENGLISH AND COLONIAL MAKERS.

TANGYE BROTHERS AND HOLMAN,

CORNWALL HOUSE, 35, QUEEN VICTORIA STREET, LONDON, E.C.,

(LATE OF 10, LAURENCE POUNTNEY LANE.)

SOLE MAKERS OF MORTON'S PATENT SELF-SEALING RETORT-LIDS,

WITH HOLMAN'S PATENT ECCENTRIC FASTENINGS,

Anti-Friction Catches, and New Self-Adjusting Cross-Bars.

Instantaneous Sealing effected. No Luting. No Duplicate Lids required.

Holman's New Self-Sustaining Cross-Bar ensures freedom of Joint, and maintains parallel position of the Lids.

Since their introduction in 1869, these Patent Retort-Lids have been thoroughly tested, being now in use in nearly all the principal Gas-Works in London and the Provinces.

T. B. and H. are now making the "Morton's Self-Sealing Lid" of the SAME FORM OR SECTION AS THE RETORT (see Illustrations above), as well as bringing the Mouthpiece from the D or Oval at back to Circular in front, as heretofore.

D and Oval Morton's Lids are working satisfactorily both in this country, on the Continent, and in the United States of America. Among others they have been adopted by the following Gas-Works:—

The Gaslight Company's Works, Fulham; Ditto, Bromley-by-Bow; Ditto, King's Cross; Ditto, Shoreditch.
And also in the Gas-Works at Richmond, Maidstone, Gloucester, Glasgow, Portsea, Roubaix (France), The Hague (Holland

HUNT'S PATENT EQUILIBRIUM GAS-GOVERNOR.

In this Governor a Throttle-Valve is substituted for the ordinary suspended Cone, all external communications being avoided by placing the Lever or Radius Arm (shown in the drawing) inside the Valve-Chamber upon the Disc. The Disc is carried upon steel centres, upon which it is accurately balanced and turns freely. The friction in working is thereby reduced to a minimum. This Governor is extremely sensitive to alterations of inlet or outlet pressure, and renders a large actuating holder unnecessary.

The principal advantages of this arrangement over the ordinary form of Governor are as follows:—

Its sensitive action prevents oscillation.

It is self-adjusting—*i.e.*, it maintains a steady pressure under variations of inlet pressure or a fluctuating consumption.

The inlet to Gasholder being contracted to the smallest possible dimensions, all danger from leakage through insufficiency of seal, tilting, &c., is entirely avoided.

The valve portion being separate from the holder, it can be handled and fixed like an ordinary Slide-Valve direct in the main; and the holder can be placed at an convenient distance immediately above it. The cost is thus materially reduced, and the inconvenience of heavy lifts done away with.

There are no working parts likely to get out of order.

These Governors have been adopted by many leading Gas Companies, among whom are the following:—

The Gaslight and Coke Co. (9), The London Gas Co. (3), and at Abergavenny, Arundel, Birmingham, Cannes (France), Devonport, Dursley, Exeter, Guernsey, Halesowen, Mentone (France), Monmouth, Newcastle-on-Tyne, Oxford, Plymouth, Rochdale, Windsor, &c.

TESTIMONIAL.

The Gaslight and Coke Company,
9, Water Street, New Bridge Street,
Blackfriars, E.C., Feb. 27, 1878.

MESSRS. TANGYE BROTHERS AND HOLMAN.

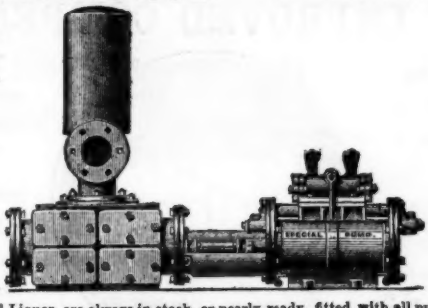
Gentlemen,—The two 24-inch and three 36-inch Hunt's Equilibrium Governors supplied by you, and fixed in the valve-rooms at Whitechapel, Goswell Road, and Blackfriars, are working very satisfactorily.

Yours truly,
(Signed) JOHN JOHNSON.

PRICES AND FULL PARTICULARS ON APPLICATION.

THE "SPECIAL" STEAM-PUMP.

Diameter of Steam Cylinder.	Diameter of Water Cylinder.	Length of Stroke.	Gallons of Water per Hour, Approximate.	Reduced Prices.
3	1½	9	450	£16
4	2	9	815	18
5*	2½	12	1,250*	20
5*	3	12	1,830*	22 10
4	4	12	3,250	25
6*	4	12	3,250*	30
5	5	12	5,070	32 10
7*	5	12	5,070*	40
6	6	12	7,330	40
8*	6	12	7,330*	50
7	7	12	9,750	50
10*	7	12	9,750*	65



In use in a Hundred Gas-Works in the United Kingdom for Pumping Ammoniacal Liquor, Water, or Tar.

Messrs. Burt, Boulton, and Haywood, Manufacturing Chemists, have over FORTY "Special" Steam-Pumps in use at their several large Tar-Works.

Two Hundred Sizes made. Those in Table opposite are the leading Sizes for use in Gas-Works and Chemical Works.

* These Sizes being usually selected for pumping Tar and Liquor, are always in stock, or nearly ready, fitted with all pump details in iron, and extra length distance-piece between steam and pump cylinder, at a small extra cost.

TANGYE'S HIGH-PRESSURE AND CONDENSING STEAM-ENGINES; CORNISH, VERTICAL, & TUBULAR BOILERS; HYDRAULIC AND SCREW LIFTING-JACKS, CRABS, PULLEY-BLOCKS, &c.

FULL PARTICULARS, ESTIMATES, CATALOGUES, ETC., ON APPLICATION.

London, 1851. New York. 1853. Paris, 1855. London. 1862.

Dublin, 1865.

The SIX MEDALS AWARDED to THOMAS GLOVER for

PATENT DRY GAS-METERS,

The latter being the Highest Medal awarded for Dry Gas-Meters by the Imperial Commissioners for the Universal Exhibition, Paris, 1867.

Paris, 1867.

THOMAS GLOVER & CO.,

DRY GAS-METER MANUFACTURERS,

214 TO 222, ST. JOHN STREET, CLERKENWELL GREEN,

LONDON, E.C.

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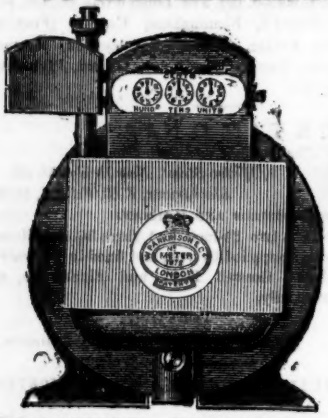

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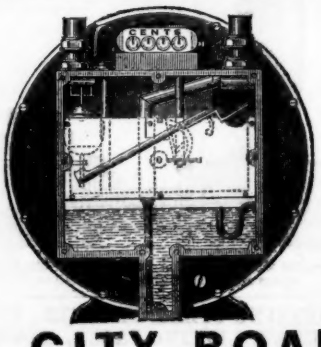

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TO CORRESPONDENTS.

B. H.—*No. An attempt was made by one of the Metropolitan Companies to obtain such an allowance; but their contention was not supported by the experts called in in reference to the matter.*

J. T.—*Next week.*

F. S. C.—*The calculations are being verified by a Gas Engineer, a Mathematician connected with the* JOURNAL, *and, if found correct, we shall be pleased to publish your letter in next number.*

Press of matter compels us to omit this week the "Treatise" article and Trade Reports, besides some other items of interest.

No notice can be taken of anonymous communications. Whatever is intended for insertion, must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.

THE JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, MARCH 11, 1879.

Circular to Gas Companies.

As we were informed, the ghastly, flickering exhibition of the electric light on the Holborn Viaduct is to come to an end. As a matter of fact, it has come to an end; for the three months contract expired on Sunday last, and the lights were extinguished the day previous. Having to cross the Viaduct frequently, we have given careful attention to these lights, and while frankly admitting that, on some evenings, and for the short periods over which our observations have extended, the lights burnt remarkably well, yet it must be admitted that, on the whole, the exhibition has been a dismal failure. The Viaduct is exceptionally well adapted for the experiment; but the light has utterly failed to satisfy the simplest requirements of a public illuminating agent. We want strength, diffusibility, and constancy, and the electric light does not give one of these. With regard to the experiment on the Thames Embankment, from the few observations we have made, the results seem to be no better than those obtained on the Viaduct. The light, which would have paled before the display Messrs. Edmundson will soon make there, ends with this week. *Sic transit!*

It is rather to be regretted that careful photometrical experiments are not to be made, to determine the relative values of the two lights. Not that mere candle power, estimated in a dark room, would give us an accurate idea of the value of the electric light. It has been shown, for example, that the light, at all events when enclosed in an opaline globe, will not penetrate a London fog so far as a single gas-burner of much less candle power. The same thing has been observed in lighthouses. It has been proved that the light given by Mr. Wigham's gas-burners is seen at a greater distance in a sea fog than the electric light without the interposition of any opaline shade.

We conclude to-day our abstract of the Gas and Water Bills presented to Parliament this year, and also of the Provisional Orders for which application has been made to the Board of Trade. There is little to be said respecting the Bills, as they follow the lines traced out by the General Acts and Standing Orders. There are only a few which will give rise to strong contentions. Opposition will be made to some, but we do not think the Committee work of the year will be very heavy. We speak with some diffidence of the Provisional Orders, for we hold it to be an anomaly that a single Government official should have the power of granting or withholding what are practically statutory rights to a Gas or Water Company. We will not go so far as to say that the Gas and Water Works Facilities Act, 1870, has worked badly; but still we are strongly disposed to recommend every Company threatened with opposition to promote a special Bill rather than endeavour to obtain a Provisional Order. In the former instance, their case is certain to be heard by a tribunal sitting in public; in the latter, we have to confess that we do not exactly know who settles the matter. Lord Sandon or Mr. Farrer ought to sit and hear the cases in public, and then we should know in what way the cases are arranged. Among the applications we publish to-day, is one, to say the least, of a very unusual character. It is to give a Company power to raise additional capital by the issue of new preference shares or stock, which is to take priority over existing preference capital. The Order further proposes that the existing preference capital shall be—at all events, the dividends are to be—extinguished. We should be glad to know something of the history of this Company, which would have been detailed in the preamble of a special Bill. No doubt it is all right, but the transaction has an odd look about it. Was any part of this preference capital ever subscribed for and paid up, and for what have the dividends, upon which it is now proposed to place the extinguisher, ever been paid?

The half-yearly meeting of the Derby Gas Company was held last Friday week, when, as usual, maximum statutory dividends were declared, and a balance of £1921 carried forward. The position of this Company is such, that the Corporation are not disposed now to molest them. The price which would be demanded, and, under the circumstances, must be paid, is quite sufficient to deter the Corporation from any attempts at confiscation. The fact is that Derby is better supplied with gas than most boroughs in the kingdom. The price is low, and the quality of the gas is, both as regards its illuminating power and purity, unexceptionable. Inhabitants of Derby are contented with their gas, as they might well be, and do not object to the price charged for it. From all we can see, there is a stable future for the Derby Gas Company. The time will, perhaps, come when attempts will be made at compulsory purchase; but, if we read the signs of the times correctly, the day will be distant when the Corporation will make a successful assault on the Company. It is impossible to pass over the opinions expressed by so eminent an Engineer as Mr. T. Hawksley, on the influence of the electric light on Gas Companies. He does not believe, any more than we do, that electricity, as at present generated and distributed, will ever affect detrimentally the future of Gas Companies. That advances will be made in the art and science of evolving and distributing electric force, we cannot doubt; but, looking forward to every possibility, we are unable to conceive of any invention which may in the least degree militate against the interests of Gas Companies.

Let us here dispose of a few paragraphs relating to the almost extinguished light. A stupid rumour had got afloat that the Corporation of Salford intended to employ electricity in illuminating all the public streets in their borough and the neighbourhood. The report was absurd enough, and we are astonished that it should for a moment have been believed. As it is, however, the Gas Committee of the Corporation have felt it necessary to give a formal contradiction to the statements circulated. The gas-works of the Corporation are now beginning to be profitable. That they have not been so hitherto, was owing to circumstances to which it is not our place to allude here. However it may be, the electric light is not to shine in Salford under corporate influences.

As our readers know, the Corporation of Liverpool have gone to Parliament to obtain the exclusive power of supplying the electric light within their limits. We have been waiting some time to know what the Chairman of Ways and Means will have to say on the matter. We expected a new Standing Order; but, in its place, we have a resolution to be moved when the Liverpool Lighting Bill comes on for second reading, to the effect that the Bill be committed to a Select Committee of seven, who will have power to inquire into the suitability of the electric light for use in thoroughfares and other public places; to consider how far and under what conditions the use of such mode of lighting should be sanctioned by Parliament in the case of Municipal Corporations and other Local Authorities, or Public Companies, and report their opinion to the House. Inasmuch as the Committee are to have power to send for papers and documents, we foresee the inauguration of an inquiry which may extend over months, and it may be years. The electric light question had best be left to settle itself. Wherever it is found useful it will be employed, and so long as no monopoly in its employment is granted, no public or private interest can suffer.

Perhaps the most favourable report on the electric light is furnished to us by Mr. M'Crae, of Dundee, where, as our readers know, experiments have recently been made. The writer admits that the light is well adapted for the illumination of public spaces, and he estimates the cost, when an opaline shade is used, at about double the cost of gas in Dundee, the lights being equal in power. We mentioned last week that when the quantity of gas consumed by a 3½-horse power gas-engine—viz., eighty feet per hour—was burned in a certain number of public lights, the result was much more effective than that obtained by the electric light. But the weather was against the experiments, and Mr. M'Crae can give us no details as to the actual photometric results.

The electric light has been introduced into the reading-room of the British Museum; the Société Générale d'Electricité kindly furnishing it to the British nation free of cost. The effect of the light under the magnificent dome is said to be generally good. The light, however, will flicker; it cannot as yet be kept constant. For the moment, readers, who have begun to frequent the room of an evening, are much gratified by the illumination. It is no doubt a relief to them to take their eyes off the musty pages they commonly pore over, and watch the vagaries of the eccentric light. At present, the light is supplied by a Gramme machine, driven by a Robey engine. We had an idea that steam-engines were not allowed to be used on the Bedford estate; but perhaps the British Museum enjoys special privileges.

The electric light has had many trials in Sheffield, but the public do not exactly appreciate it, and recently Mr. E. Bainbridge read a paper before the members of the Literary and Philosophical Society of the borough, which completely demolished its pretensions to be a cheap and useful illuminant.

The Corporation of South Shields have resolved on opposing the Bill of the South Shields Gas Company. The opposition, we gather, is mainly raised against the maximum price, which the Town Council consider too high. It ought to be remembered, however, that a maximum price means just what the term indicates. The price may never be charged, but the Company ask for a margin to fall back upon, in case difficult times occur again. We fear the money expended by the Corporation in opposing the Bill will be thrown away.

We are happy to see that a compromise has been arrived at between the Town Council of Newcastle and the Newcastle and Gateshead Gas Company, by virtue of which parliamentary opposition to the Company's Bill will be withdrawn. In the first place, the Company renounce any claim to a monopoly in the supply of the electric light. Next and more important, it has been arranged that the maximum price of gas shall be 3s. 4d. per thousand feet, but the sliding scale shall not come into operation until the charge is below the present selling price—viz., 2s. 9d. per thousand. These appear to us to be very fair terms. The Company will be able to pay full dividends when the price charged is 3s. 4d., and when it goes below 2s. 9d. the upward side of the sliding scale will come into operation.

The Local Government Board have allowed the Bromley Local Board to proceed with their opposition to the Gas Company's Bill, notwithstanding the want of an absolute majority of the whole Board. The powers of the Local Government Board are becoming very extensive, and their exercise must be watched with attention. The proceedings in this case are perfectly legal, but it is strange in English legislation that the fiat of a Government department should override the express provision of an Act of Parliament.

The Bill of the Brighton and Hove Gas Company will have to encounter the opposition of the Corporation of Brighton and the Local Boards of Hove, Portslade, and Aldrington. The objectionable part of the Bill, to the minds of the Authorities, appears to be the price asked for, which they all consider excessive.

The Improvement Commissioners of Ramsgate have, during the past year, done very well with their gas and water works. The gas undertaking brought a net profit of £3119, which, added to a previous balance, gives the Commissioners a sum in hand of £3931. This is so good a result that we hope the Commissioners will soon take into consideration the propriety of further reducing the price of gas. The water department, which may as well be mentioned here, is relatively no less profitable; the net profit of the year having been £916, which, added to a balance in hand, leaves the Commissioners £1090 to the good. Considerable extensions of mains of both gas and water, to meet the wants of a continually increasing number of consumers, are being proceeded with. The Chairman, the Rev. E. G. Banks, may be so far congratulated upon the results of his persistent agitation. Much praise is given to Mr. Valon, C.E., the Engineer of the Commissioners, for the excellent condition in which the works are maintained. There is a question as to the quality of the gas, and the appointment of an official tester. The Commissioners undoubtedly ought to appoint a competent and independent tester, whose reports would set the minds of complaining consumers at rest.

The Southern District Association of Gas Engineers held their quarterly meeting on Thursday, the 13th ult., under the presidency of Mr. J. West, of Maidstone. The Association grows in importance, and now, it seems, numbers amongst its members several Metropolitan Engineers, from whom it appears much is expected. We cannot follow Mr. West through all the topics so well dealt with in his address, but we may at once call attention to his remarks on the retort-house and carbonization. It has been well said that the profits of a Gas Company are made in the retort-house, and hence economy of fuel and labour is of great importance. If regenerative furnaces can, as we believe they may be employed with a double advantage of economy and of a more constant temperature, they ought to be used to a greater extent than they now are. If, too, mechanical stoking can also be employed with similar advantages, as we believe it may be, the machines should come into more general use. The question is really a very narrow one; but Gas Companies are so averse to step out of the ordinary routine, that we almost despair of seeing many improvements effected in the retort-house. As regards purification, Mr. West detailed some remarkable results obtained in closed vessels, by Mr. Hammond, of Lewes. These results are extremely encouraging, and Managers, wherever they can, should follow Mr. Hammond's footsteps. But this gentleman has a patent, and although all Gas Companies who go to Parliament in these days apply for power to use patent rights, as a matter of fact they seldom exercise the privilege acquired, if they can avoid it. The economy and usefulness of gas-engines are so well understood, that little need be said in recommendation of their employment, wherever circumstances admit of it. In gas-works of any but the largest size they ought entirely to supersede steam-engines; but there are the steam-engines, and they must be worn out, or sold at a sacrifice. We really think the Southern District Association is doing useful work, and we are much pleased with the little formality observed in the proceedings. The discussions are of a conversational character, and this affords us nothing to report—a circumstance we and our readers must regret. We have only to add that Mr. West's address was listened to with great attention, and was highly applauded.

Mr. J. Hepworth, of Carlisle, has followed good examples in the endeavour to make his customers better acquainted with gas and its use. He recently delivered a lecture, well illustrated by experiments, which excited much interest among his audience. The display of Mr. Sugg's large burners and new lamps commanded much admiration, and the albo-carbon light was duly appreciated.

Water and Sanitary Notes.

The annual conference on sanitary matters held, by the Society of Arts, will take place on the 15th and 16th of May next, as usual, under the presidency of the Right Hon. J. Stansfeld, M.P. This year it is proposed to limit the business of the conference to a discussion of "the results of any systems, already adopted "in various localities, referring to the subjects of national water "supply, sewage, and health; to elicit further information "thereon; and gather, and publish for the benefit of the public "generally, the experience gained." The limitation of the discussion, as above mentioned, will shut out a number of intolerable quacks, who have been in the habit of congregating in the Adelphi, to air their visionary schemes, with the ultimate view of making an attack on the public purse. What good these annual discussions at the Society of Arts, on what are called sanitary matters, do, we are utterly at a loss to know. It is, no doubt, in the opinion of Mr. E. Chadwick, C.B., of the utmost importance that the little world in which he moves should know the views he has been expressing for, say, twenty-five years past; and it is equally important that the same little world should understand the notions entertained by Sir H. Cole, K.C.B. To the best of our recollection, Mr. E. Chadwick has never been interested in a patent; but, in the coming statements and discussions to be heard in the Adelphi, we shall expect to have from Sir H. Cole a full, true, and particular account of the results of General Scott's sewage cement process, scientific and sanitary, at Burnley, and also of the results of the same process obtained by Sir H. Cole himself at Birmingham. With regard to sewage farming, we hope that some really useful information may be communicated to the conference. We do not expect that a farm belonging to any Local Authority will be shown to have produced a profit applicable to the district-rate, after interest for capital, and all charges, have been deducted; but we do wish to find a farm paying all the expenses connected therewith. Despite the view we take of the utter uselessness of these discussions in the Adelphi, we shall attend them, and endeavour to gather whatever may turn up to assist us in deciding on the best systems for "national water supply, sewage, and health."

Mr. Leslie tried very hard last year to persuade the Metropolitan Board of Works that they had no power to pay out of the public rates the cost of promoting their two Water Bills. Of course, he was not listened to; fortunately, or unfortunately, he never is, and he generally stands as the only supporter of his own motions. Mr. Leslie is not a lawyer by profession, but perhaps there is no member of the Metropolitan Board who is better acquainted with their legal rights and responsibilities. In this instance, however, and after a delay, Mr. Leslie finds some support. The District Board of St. Olave's, Southwark, have taken counsel's opinion, and the oracles have replied "that the Metro-"politan Board of Works were not acting within their statutory "powers in promoting the Water Supply and Water-Works "Purchase Bills introduced into Parliament in the last session, "and, consequently, the Metropolitan Board are not justified in "paying the expenses incidental to the promotion of such Bills "out of the rates." This is rather an awkward fix, but a sly clause in a Bill will save the members from any surcharges.

Dr. Lyon Playfair has given notice that he will call the attention of the House of Commons to the increasing rate of mortality in the Metropolis, and also to the increasing impurity in the Metropolitan Water Supply. The death-rate in London has certainly for some weeks been unusually high, but the fact can only be ascribed to the severe weather which prevailed so long. Of increasing impurity in the water supply we have no knowledge. The quality is, considering all things, remarkably constant. The proportion of organic matter in the water taken from the river does certainly vary, but only within narrow limits, and we have failed to discover any indications of a progressive rise in the amount. There are, we think, on the contrary, signs of a gradual improvement in quality. That Thames and Lea waters should ever be as free from organic matter as water from deep wells in the chalk, is not to be expected. But, after all, what connection can be fairly established between a water supply, such as we have, and the death-rate of the population? Why is water always to be called to account for any excess of mortality? Dr. Playfair's object, we may assume, is to make another attack on the Metropolitan Water Companies, and to advocate a total discontinuance of the river supply. To supersede that supply would necessitate many years of labour and a large expenditure; and would, besides, involve the rendering unproductive of an immense amount of capital, the interest on which the London public would have to pay in some way or other. The House of Commons will think twice before it gives an implied sanction to a change of supply.

There are complaints of scarcity of water at Newcastle-on-Tyne. No wonder. On receipt of the complaints, the Company sent round their inspectors to examine the fittings, and these officers discovered 2600 taps left running in order to prevent the freezing of the pipes, and 300 burst pipes not repaired. Although we have not specific numbers from any other place, we may take it for a fact that a similar waste has been going on during the frosty weather all over the country, and Corporations and Companies have equally to complain of the reckless wastefulness indulged in by consumers.

It would appear that the undertaking of the Margate Water-Works will presently be transferred to the Corporation of that borough. The price of £59,000 has, it seems, been agreed upon, and Mr. E. Easton reports that the concern is well worth the money. Now that the Corporation are likely to acquire the undertaking, it is discovered by the Town Council that the water is the purest—in fact, the best in the kingdom.

The Bill of the Lower Thames Valley Main Sewerage Board has been, as we expected would be the case, rejected by the Commons without a second reading. We are somewhat sorry for this, although the Bill had some objectionable features. These, however, might have been removed by a Select Committee, and the Bill have gone forward in an amended condition. We hardly see on what grounds the Bill was thrown out. Though Colonel Haywood's scheme may not be the best that could be devised for carrying out the object for which the Board was constituted, it deserved something more than summary dismissal from public consideration. The proposal to institute a sewage farm of six or seven hundred acres, in what may be called a genteel neighbourhood capable of development, would naturally alarm both inhabitants and landed proprietors. The former would fear that all sorts of dangers to health would result from the propinquity of the farm to their dwellings; and the latter would see, with more reason, the prospect of a reduction in the value of their property. To the combined influence of these two ideas we must attribute the opposition to the Bill, which resulted in its defeat. We are given to understand that the powers possessed by the Local Government Board will be evoked, with a view to carrying out the scheme.

If meteorology is ever to be made a science, as we believe it will in the course of a century or two, it can only be done by long continued, patient, and accurate observations of what we may call weather phenomena. Happily, we have in the United Kingdom—and there are, in fact, distributed all over the civilized world—painstaking observers, who record what they see, and collate, as far as practicable, whatever conclusions suggest themselves. We cannot here refer to the large question involved; but we wish to draw particular attention to a record of "The "Meteorology of Nottingham for the Past Twelve Years (1867 to "1878 inclusive)," as observed daily by Mr. M. Ogle Tarbotton, F.M.S., &c., the Borough Engineer. To the observations taken in Nottingham are added tables of the rainfall at various stations in the valley of the Trent. We can here only heartily thank Mr. Tarbotton and the Corporation of Nottingham for the really elegantly-printed volume in which the observations are recorded. If all Local Authorities in the kingdom could find officers capable of observing, and would go to some expense in publishing the observations, our knowledge of the meteorology of the United Kingdom would soon be increased, and an advance be made to the construction of a real science.

Reduction in the Price of Gas at Londonderry.—In a letter recently addressed by Mr. John Macnie, the Secretary and Manager of the Londonderry Gas Company, to the Clerk of the Local Municipal Council, it is stated that the Directors of the Company have resolved to make a reduction in the price of gas equal to 5 per cent. on the present rate for the current year, thus making the price 4s. 9d. per 1000 feet, or 1s. below the standard authorized by their Act of 1877; also to reduce the price per public lamp to £3 16s.—or 5 per cent. over all, from the commencement of the current half year's accounts.

King's Lynn Gas Company.—The eighteenth ordinary meeting of this Company was held on Friday, the 28th ult.—Mr. J. D. Thew in the chair. The Chairman congratulated the Shareholders upon the prosperity of the Company, and moved that a dividend be paid for last half year at the rate of 5½ per cent. per annum. Mr. Bagge seconded the proposal, which was carried. Mr. W. Parker and Mr. Robinson were re-elected Directors, and Mr. R. Cruso as Auditor, Mr. G. W. Page being elected an Auditor in the place of the late Mr. E. King. The business of the meeting having been transacted, a vote of thanks was given to the Chairman.

Hampton Court Gas Company.—The annual meeting of this Company was held on Monday, Feb. 24—Mr. F. J. Kent in the chair. The Directors report recommended the payment of the usual dividend for the half year ending Dec. 31, 1878, of 5 per cent. on the A, and 3½ per cent. on the B shares respectively, making for the year the maximum dividends allowed by Act of Parliament. The capital account (against which there stood a balance of £1081 14s.) showed that the cost of extension of works and mains during the year was £1423 0s. 8d. The revenue account showed that, after paying the half year's dividend to June 30, 1878, providing for the half year's dividend to Dec. 31, to be paid immediately, deducting for discounts and bad debts (£237 19s. 9d.), for wear and tear of engines, &c. (£680), providing for all amounts outstanding unpaid, and setting aside £2000 as reserve-fund, there remained a balance of £3852 12s. 3d. to carry to next year's account.

THE TRIAL OF THE ELECTRIC LIGHT.

THE three months trial of the Jablochkoff candle on the Holborn Viaduct is now at an end, and the same will be the case on the Victoria Embankment at the close of the present week. The Corporation tried the same system of electric illumination for the interior of Billingsgate Market, and were not long before they were content to abandon the attempt. The Commissioners of Sewers are responsible for the Viaduct experiment, and the Metropolitan Board of Works for the trial on the Embankment. In all probability the last will prove to have been the most elaborate, and the report to be made by Mr. Keates will be awaited with much interest. Whatever may be the conclusions arrived at by Mr. Keates, we have no doubt they will be based on the most precise data, and, should the purport of the report be of a decisive character, the effect on the public mind will be very marked. Already a notable fact is making itself apparent, and we shall expect to find it confirmed by the scientific investigations of Mr. Keates, whose photometric skill is well known. The fact to which we advert is the enormous discount which now has to be made in respect to the extraordinary lighting power originally attributed to the Jablochkoff candle. Instead of a naked light equal to a thousand candles, reduced to four hundred candles by the intervention of the opalescent globe, we now find that the naked light is only equal to something like five hundred candles, which, being reduced sixty per cent. by means of the intervening globe, leaves no more than two hundred candles of practical lighting power. At this rate we need scarcely wait for any elaborate report in order to ascertain whether the Jablochkoff system is capable of entering into commercial competition with gas supply. The bare cost of the carbons will sufficiently indicate which way the balance is to be struck. We believe the carbons used on the Thames Embankment have cost fivepence per hour for each lamp. It is stated that the French Company are now able to bring the price down to fourpence per hour per lamp, and have done so in the trial of their light at the British Museum. We may, therefore, conclude that by this system we can have the light of two hundred candles per hour at the cost of fourpence, so far as the carbons are concerned. We may now compare this with the cost of gas. Taking sixteen-candle gas at 3s. 6d. per thousand feet, and reckoning each lamp to consume five feet per hour, we shall require, in the first place, between twelve and thirteen burners to give us the light of two hundred candles, and the total consumption of gas per hour will be sixty-two and a half feet, costing slightly over twopence halfpenny, or not much more than half the price of the carbons in the case of the Jablochkoff candle. If it be urged that the consumer seldom realizes the full benefit of sixteen candles for each five feet of gas consumed, we will accept for argument's sake a calculation at the rate of ten candles of effective illumination for five feet of gas. Twenty burners will then be requisite, and the consumption will be one hundred feet, costing a fraction more than fourpence, which is practically the same as the cost of the mere carbons required for the Jablochkoff light.

But this mode of stating the case omits one important element in the problem. The gas-lamps, which by their aggregate light would be reckoned equal to one Jablochkoff lamp, would illuminate a given space far more effectually than the solitary electric light. Thus, a lower total of candle power would suffice for the gas, and would give the latter an economical advantage. The carbons may be cheapened still further, and this part of the affair may be found less expensive when other modes of electric lighting are put to the test. But the power which gas possesses of undergoing division into lights of ten or sixteen candles each, enables it to compete with electricity at a great advantage. Leaving, however, this question of the carbons, we ask the public to consider what lies beyond—namely, the steam-engine and its coals, the dynamo-electric machine, the costly cables of conducting wire, and the probable necessity of duplicating both the engine and the machine. When these considerations are borne in mind, it is impossible to avoid the conclusion that lighting by electricity must have a sphere of its own, where it may happen that gas is inadmissible, or where a large concentrated light is an actual condition of utility. The extreme costliness of the Jablochkoff light has scared the City Commissioners of Sewers. But the Trustees of the British Museum may be content to bear the cost, seeing that they are afraid to introduce gas. At Billingsgate, where the ordinary business of life has to be carried on, gas remains paramount—a result the more remarkable, seeing that the space to be illuminated was a large one. The proof of the pudding is in the eating, and the experience gained by the Civic and Metropolitan Authorities may serve as a check to the enthusiasm of speculative minds, ready to "worship the rising sun of "electricity." This particular sun seems to linger long near the horizon, and the world is not yet much the brighter for its presence. Neither does science favour the idea that, for the innumerable ordinary purposes of life, any form of electric illumination will supersede the use of gas. Some new discovery, not yet announced, has to be made before the Gas Companies will be compelled to retire in favour of the electric light.

The estimate we have allowed for argument's sake in respect to the lighting power of gas—namely, that of ten candles instead of sixteen—is not one which we are inclined to accept as a necessary and permanent result. It is quite practicable for the consumer to realize, with the improved appliances now available, the full lighting power of the gas. In the case of street lighting, it is possible that true economy demands a somewhat higher amount of lighting power than sixteen candles; but we question whether there is any need to go so high as one or two hundred candles, except for the sake of meeting the electric light on its own ground. Gas is sacrificing one of its own inherent merits in following the example of the electric light in this particular. Electricians would be glad beyond measure if they could produce ten lights of twenty candles each at as cheap a rate as one light of two hundred candles. In respect to the charge made for the Jablochkoff candle, it is stated that the French Company have offered to light up the Viaduct at a total charge of fivepence per hour per lamp. If this is to include everything, we may call it a liberal offer. Whether such a rate of charge would be profitable to the Company may be considered doubtful. As compared with gas, we may observe that fivepence would buy one hundred and twenty feet of gas, equal to twenty-four lamps each with a lighting power of sixteen candles. It is not difficult to see which would be preferable. It may possibly appear, by the forthcoming official reports, that the estimate of two hundred candles as the lighting power of the opalescent lamp, is rather below the true value of the Jablochkoff light. But we shall be very much surprised if the most favourable results approach at all near to three hundred candles as the average power. It has also to be borne in mind that all this has reference to little or nothing more than the lighting of streets and large buildings. When we come to the lighting of shops and houses, the impracticability of the electric light in its present phase becomes still more striking, and the chance that the new illuminant will in that respect compete with gas, appears too remote to be seriously entertained.

GAS AND WATER PROVISIONAL ORDERS FOR 1879.

(*Continued from page* 308.)

The *Longridge Gas Order* is to fix the limits of the Longridge Gas Company, and to give them power to maintain and continue existing works. The capital of the Company is to be £10,000, the amount originally subscribed, and no additional is asked for at present. Gas of fifteen-candle power is to be supplied, tested by the usual burner, and the price is not to exceed 8s. per thousand feet.

The *Maidstone Water Order* is to enable the Maidstone Water Company to raise £16,000 additional capital, and to borrow £4000. The dividends on the new capital are limited to seven and six per cent., according as it is raised by ordinary or preference shares. The additional capital is to be applied solely to the purposes of the undertaking.

The *Margate Water Order* is to authorize the Margate and Broadstairs Water-Works Company to raise, for the purposes of their undertaking, further capital to the extent of £7500, and to borrow £2500. A special clause in the Order protects the rights of the Broadstairs Water Company.

The *Mexbrough District Water Order* is to empower the Mexbrough and District Water Company, Limited, to construct works for the supply of water to the township of Mexbrough. The works are to consist of a well, pumping-station, and the necessary accessories, which are to be completed in three years, in accordance with the provisions of the Gas and Water Works Facilities Act, 1870. The share capital is not to exceed £10,000, and no borrowing power is asked. The rates proposed to be levied, and the extras, are about those usually charged.

The *Northfleet Gas Order* is to authorize Mr. W. G. Head to maintain and continue the existing gas-works in the town of Northfleet, for the supply of that town and Swanscombe. The capital to be employed in the undertaking is to consist of the £10,000 already raised by Mr. Head, and an additional £10,000, and borrowing power is sought to the extent of £5000. The interest on the borrowed money is not to exceed five per cent. Subject to the sliding scale, the standard price of gas is to be 5s. per thousand feet. The gas is to have the illuminating

power of fourteen candles, tested by the "London" Argand burner, No. 1.

The *Oystermouth Water Order* is to authorize Messrs. Beor, Bill, and Ludlow to construct water-works for the supply of Oystermouth and Bishopston. Water is to be obtained from some springs in the parish of Bishopston. The share capital to be employed in the undertaking is to be limited to £6500, with borrowing power to the extent of £1500. The rates to be levied for domestic supply are somewhat lower than usual, and the extras are those commonly charged. The undertakers ask for all the ordinary powers of a Water Company.

The *Rhyl District Water Order* is to authorize the Rhyl District Water Company to raise additional capital to the amount of £12,000, and to borrow to the usual extent. The additional capital is to be raised by the issue of new preference shares or stock, such shares or stock to be entitled to dividend in priority of any existing preference stock or shares; but it seems to be proposed by the Order that the existing preference capital shall be extinguished.

The *St. Alban's Water Order* is to authorize the St. Alban's Water-Works Company to raise £20,000, and to borrow £5000. The dividends on the new capital are limited to seven or six per cent., according as it is raised by ordinary or preference shares. The money raised by authority of this Order is to be applied, first of all, to paying off floating debts of the Company not secured by mortgage, and then to the general purposes of the undertaking.

The *Shoreham and District Water Order* is to authorize some extension of the limits of the Shoreham and District Water-Works Company, and the construction of some new works. Power is sought to raise £16,000 of additional capital, by the issue of new shares, and to borrow £4000. A portion of the money raised is to be applied towards paying off existing mortgages, and to discharging outstanding debts and obligations; and also to transferring to capital account moneys which have been paid out of revenue.

The *Stourbridge Water Order* is to authorize considerable extensions of the limits of the Stourbridge Water Company, and to empower the Company to raise £20,000, and to borrow to the usual extent in respect thereof. The dividend on the new capital is to be limited to eight or six per cent., according as it is raised as ordinary or preference.

The *Thirsk Water Order* is to empower the Thirsk Water Company, Limited, to construct water-works for the supply of Thirsk and some townships in the neighbourhood. The supply is to be obtained by impounding the water of some becks and small streams, and it is to be furnished to the consumers in as pure a state as circumstances permit. The capital asked for in the Order is £16,000, carrying the usual borrowing powers. The scale of rates for a domestic supply is set out at much length; but, as a matter of fact, they are about the same as those usually charged by Water Companies. We notice one reservation—namely, that the domestic supply is not to include water for a closet, the rate for which is to be 10s. per annum. The Company ask for all the general powers usually accorded to a water undertaking.

The *Ventnor Gas and Water Order* is to authorize the Ventnor Gas and Water Company to raise additional capital to the amount of £30,000, and to borrow £7500, to be applied to the purposes of the undertaking as settled by the Act of 1866. The new shares are to be offered by auction or tender, and the premiums are to be applied as usual. The full nominal value of the share, together with the premium, is to be paid within three months of the date of sale. Shareholders are to have their usual privileges, if they make equal bids, and if the shares are not sold at the auction. The dividends on the new capital are limited to seven or six per cent., according as it is raised.

The *Wantage Gas Order* is to empower the Wantage Gas Company to maintain and continue gas-works for the supply of the parishes of Wantage and Letcomb Regis. The capital of the Company is to consist of £2000 already raised, with a further sum of £10,000, which is to be authorized by this Order, and power is asked to borrow £3300. The new capital is to be offered by auction or tender, and to be paid up in the manner now usually prescribed. Shareholders are to have their usual privilege in respect of shares not sold at the auction. Gas of fourteen-candle power, tested by the usual burner, is to be supplied, at a price not exceeding 6s. 8d. per thousand feet.

The *Wellingborough Gas Order* is to authorize the Wellingborough Gaslight Company, Limited, to maintain and continue gas-works for the supply of Wellingborough and Irchester. The capital is to consist of the original £25,000, of which £17,500 has been paid up and expended, and a further sum of £12,000 to be authorized by this Order. Borrowing power to the extent of £9375 is asked. The new capital is, of course, to be offered by auction, under the usual restrictions, and with the customary privileges to shareholders. The sliding scale is to be applied, the standard price of gas being 4s. 6d. per thousand feet. The gas is to have the illuminating power of fourteen candles, tested by the usual burner.

The *Ystrad Gas and Water Order* is to authorize the Ystrad Gas and Water Company to raise additional capital to the extent of £40,000, carrying the usual borrowing powers. The money is to be applied towards paying off the debts of the Company not secured by mortgage, and then to the general purposes of the undertaking, as settled by the Act of 1868 and the Order of 1872. Beyond this the present Order only seeks some powers which are commonly granted to gas and water undertakings.

Communicated Article.

GAS AS FUEL.

By "Isca."

Although the chief usefulness of gas has hitherto been considered to lie in those illuminating qualities which will, in all human probability, still constitute its principal claim to public favour in the future, recent events have shown that its possible adaptability as a fuel, to a greater extent than is at present common, has been impressed on the public mind with considerable force.

Among the many conjectures to which the lately threatened subjection of gas lighting by the electric light, in some or all of its new forms, gave birth, not the least remarkable was the anticipation that, although possibly ousted from the chief field of their activity, the manufacturers of gas might easily take a new line, and find not less profit in the factory and the kitchen, than erstwhile in the street or the hall; and, amid all the wild expectations as to the Edison light, it was never imagined that it could supersede gas in the less obtrusive path so indicated.

The immediate necessity for thus revolutionizing the character of the work to be done by gas, and consequently also of the nature of the article itself, having failed to become imperative, it will scarcely be profitable to institute any speculative inquiries as to what changes might have been made to meet the requirements of a new era; but, without any undue confidence, it may be assumed that the possibility exists of creating such modifications in the nature of gas from coal as to adapt it to any of the purposes of fuel, to a degree but little suspected even by those who, regarding the matter from the standpoint of the ordinary consumer, were disposed to allow it considerable credit in that respect.

Meanwhile, it may be interesting to briefly examine the whole question of the relation of common coal gas, as at present supplied in our towns, to other combustibles generally used as fuel; considering not so much the details of cooking dinners or boiling kettles—plentiful instances of which species of experimental research are advanced by every maker of stoves and kitcheners—as endeavouring to ascertain, in some measure, the ultimate possibilities of the various substances dealt with.

The chemical change in the molecular arrangement of matter which is known as combustion, may be described as the combination of oxygen with other elements in such an energetic manner that the union is accompanied by the manifestation of heat, and sometimes light. Thus, supposing, by way of illustration, that combustion is a product of only two separate factors, we may represent oxygen by its symbol, O, and the other agent by x, and say that combustion is represented by $O\ x\ (n)$; supposing n to be a measure of the energy displayed in the operation. Following up the line of thought thus suggested, it would appear feasible to construct a table of what, for want of a better term, may be called oxidizing affinities, leading up, from combinations almost inert, to those whose mutual attraction is highest. Unfortunately, such an idea is not practical, the observed facts in reference to the action of oxygen on other bodies, not admitting of such rigid classification; so that, although the actual quantity of oxygen necessary to combine with any substance with which it has an affinity, may be determined and catalogued, we should not thereby be put in possession of a useful measure of the energy actually manifested, and capable of being utilized for its thermal effect.

It is this useful effect of combustion—this palpable result—which we want to be able to measure, and it is the default of any inherent index of it in the nature of substances, which has led to the general adoption of a standard of measurement known as the "unit of heat," which is an arbitrary quantity represented, in this country, by the change in temperature of one pound of water through one degree of the scale of Fahrenheit's thermometer. As might be expected, from being an attempt to measure a cause by its obvious effect, this is not by any means a thoroughly satisfactory standard; but inasmuch as it is fairly constant and easily understood, it may well be used the comparison of results analogous to itself.

Presuming, then, that the useful effect of the combustion of any substance is to be measured by the thermal change it is capable of causing in a known weight of water, it is not by any means easy to arrange the several parts of what is to be used as a measuring apparatus in such a way as to secure reliable results. When it is remembered that it is so difficult to use such a comparatively simple thing as a measure of length in a perfectly trustworthy manner, that few persons are found to exactly agree in the measurement of any rather embarrassing line—such, for instance, as the base of the Great Pyramid—there is nothing very surprising in the fact that, in the

attempt to measure, by the accepted standard, the heating power of one of the simplest as well as most important combustible we have—carbon, for example—results have been obtained which differ with nearly every individual observer.

These and similar considerations have led some physicists to pronounce the modern science of heat, if it can so be qualified, a mere plausible, but utterly inaccurate string of rules and assumed principles, based on data so inconclusive as to be worthless when treated as material with which to build anything like a substantial scientific edifice.

But while admitting much of this kind of argument to be true, we may yet make use of most of the data which have been laid down, as the observed results of experiments made with great care, and which are, probably, as conclusive as will be desired by those who are content to regard a carefully conducted laboratory experiment as giving a pretty close approximation to theoretic accuracy, when regarded in comparison with the necessarily rougher processes of every day practice.

While granting the above proposition respecting the average value of those observations, which have been already tabulated, and are to be found in every Manual on Heat, it is impossible to avoid comment on the considerable difference in the statements of various competent authorities respecting the experimental value of certain very important combustibles. Thus the following table exhibits in an obvious manner the glaring discrepancy of results, of which considerable capital is sometimes made:—

Pounds of Water Heated 1° per Pound of Substance Burnt.

Substance.	Authorities.				
Elements—	Andrews.	Dulong.	Letheby.	Clement.	Despretz.
Carbon . . .	14,220	12,906	14,544	—	14,040
Hydrogen. .	60,854	62,535	62,030	39,807	42,552
Compounds—					
Carbonic oxide	4,376	4,478	4,325	—	—
Marsh gas .	23,594	—	23,513	—	—
Olefiant gas .	21,495	—	21,344	—	—

A few only of the constituent substances in common use, either in the form of solid or gaseous fuel, are given, but the list might be extended to include oils, wood spirit, &c. Enough, however, may be gleaned from those given to show that the very alphabet of heat is in a singularly indeterminate condition, and that there is ample scope for further investigations into this important question. When the absolute values of carbon and hydrogen are ascertained, the effects of all combustibles which contain either or both of these all-important elements may be readily ascertained by computation. This has repeatedly been done, and the values so obtained have been so far verified by direct experiment as to show that it is perfectly safe to adopt such a mode of procedure.

Returning to the two elements of hydrogen and carbon, it seems almost incredible that, whereas Clement only made its heating power 39,807 units per pound, Dulong should have found it 62,535 units; but inasmuch as the latter result has been closely approached by Letheby and Andrews, not to mention other observers, we may take 62,500 units per pound to be a fair expression of its value. In the case of carbon, to which Letheby assigns 14,544, and Dulong only 12,906, the weight of evidence is again in favour of the higher number, and we may therefore conclude 14,500 to be about the value of its ultimate effect.

It is not to be supposed that these results are to be expected in general practice; they only serve to show what is possible to be obtained under proper conditions. As a matter of fact, the best burners or furnaces in practical use do not give results approaching the theoretic possibilities of the fuel with which they are fed. In some measure this is practically inevitable; but, to a great extent improvement is very practicable. One great cause of waste is the necessity of allowing the products of combustion from the fire to pass off, by the chimney, at a temperature considerably higher than that of the air admitted to the fuel, without which there could be no draught. Then it is practically impossible to ensure the heat evolved being absolutely confined to the work required of it, a large proportion being always dissipated by radiation both from the fire-box and from every portion of the boiler, or other recipient of the heat, which is exposed to a lower temperature than its own. And it is also impracticable to so regulate the admission of air to the fire that the exact quantity of oxygen required may be brought into contact with the fuel. All these drawbacks operate simultaneously, and their combined effect is very serious. In fact, in the case of steam-boilers, it is only in rare instances, when very great care has been exercised, that coal which, from its chemical constitution, might be valued at about 13,000 units per pound, has performed an actual duty of about 9000 units per pound; being a leakage of nearly 31 per cent., and the general waste amounts, in most cases, to about 55 per cent., or even more.

The following table, which is taken from Box's "Treatise," exhibits the average proportionate distribution of the heat in one pound of coal, in the case of an ordinary internally fired Cornish boiler:—

		Units.
In ashes, unburnt, 5 per cent. on 13,000 . . .	=	650
Lost by air in chimney, 20 per cent. on 13,000 .	=	2,600
Radiation, &c., 12 per cent. on 13,000 . . .	=	1,560
Utilized in production of steam, 65 per cent. on 13,000	=	8,190
Total		13,000

These results may be considered to hold good for any kind of solid fuel, due allowance being made for its special value; the loss by escape of heated air in the chimney being chiefly due to the form of the fuel, which demands a certain amount of draught to draw air through the interstices of the material, in order to ensure perfect combustion. If too little air is admitted, the carbon of the fuel is only burnt to carbonic oxide instead of to carbonic acid, producing but 4400 instead of 14,500 units per pound; while the sharp draught essential to obviate this difficulty causes trouble of a different kind, by drawing in a large volume of inert nitrogen with the superfluous oxygen, particularly through a thin fire, and the energy expended in raising this to the temperature of the rest of the matter in the furnace is so much withdrawn from its proper object, and, therefore, thrown away.

Correspondence.

[*We do not hold ourselves responsible for the opinions expressed by Correspondents.*]

THE ELECTRIC LIGHT.

Sir,—The inability to store and gradually deliver or distribute the electric fluid is a view of the question of electric lighting which has not hitherto been dealt with as its importance deserves. To my mind, it constitutes by far the greatest obstacle in the way of electricity becoming generally available as a source of light which, like gas, shall always be depended on. The question of mere cost sinks into insignificance in presence of the magnificent light which electricity affords.

In respect to constant and unvarying supply, the chemical method (by means of the battery) of producing the current is perhaps superior to the mechanical, as now employed.

The storeage of frictional electricity in a Leyden jar, and on other insulated surfaces, is not to be taken as a proof that one-half the difficulty named is already surmounted. Any such storeage is much too precarious and short-lived to be of value as a means of ready supply. A damp atmosphere, as is well known, quickly dissipates the fluid so collected. But even supposing that the successful, and at all times certain, storeage were accomplished, how is the gradual distribution to be achieved? That is a problem which may well tax the ingenuity of the ablest electricians and inventors. Time and money spent in the invention and perfecting of electric lamps and candles are simply wasted until the problem of storeage and gradual distribution is solved.

Thos. Newbigging.

5, *Norfolk Street, Manchester, March* 5, 1879.

ELECTRIC LIGHT BILLS IN PARLIAMENT.

Sir,—The notice from the Chairman of Ways and Means, which appears in the "Votes" of this morning, you would doubtless convey to your readers, with the usual "Parliamentary Intelligence," in your next number; but I shall feel obliged if you would kindly give it insertion here, to enable me to make a few observations upon it. It is, that, on the second reading of the Liverpool Lighting Bill, he will move—

"That the Bill be committed to a Select Committee of seven members, four to be appointed by the House, and three by the Committee of Selection: That it be an instruction to the Committee that they have power to inquire into the suitability of the electric light, and of any schemes for lighting by electricity or other improved methods, for use in thoroughfares and other public places; to consider how far and under what conditions the use of such modes of lighting should be sanctioned by Parliament in the case of Municipal Corporations, other Local Authorities, or Public Companies, and to report their opinion to the House; and that such of the petitioners against the Bill as pray to be heard by themselves, their Counsel or Agents, be heard upon their petitions, if they think fit, and Counsel heard in favour of the Bill against such petitions: That the Committee have power to send for persons, papers, and records: That four be the quorum of the Committee."

When your readers peruse this, they may safely conclude that it has passed beyond a notice, and become an Order of the House; that it will be promptly acted upon; and that the first meeting of the Committee may be looked for in the week commencing on the 24th inst.

It is important to notice that the instructions to the Committee are to inquire into the suitability of the electric light for thoroughfares and public places; and, if suitable, into any scheme for applying either that or any other improved method for lighting such places. It must, therefore, be clearly understood that the inquiry is not merely to apply to the scheme proposed by the Liverpool Bill, but to that or any method that may be suggested to the Committee for the better lighting of thoroughfares and public places.

A Committee appointed in this way, although differing in its appointment from the mode usually adopted in appointing Public Committees, is, nevertheless, always regarded as a Public Committee, before whom all parties interested in any matters referred to the Committee have a right, without any question of *locus standi*, to attend and be heard.

The promoters of the Electric Light Bills of this session, although they have withdrawn their Bills, and all other persons interested in promoting electric lighting, as well as all gas companies, whether they have promoted Bills themselves or not, will have a right to appear before the Committee, and explain their views for or against (as the case may be) any scheme that may be proposed.

When the Committee have completed their inquiries, they are to report their opinion to the House; and, when this is done, the House will appoint a day for the report to be taken into consideration, so that any persons aggrieved by the report may, if they think fit, have the question ventilated again in the House, by raising a discussion on the consideration.

From these proceedings it may be reckoned that in no event will any provisions respecting the supply of the electric light, or the conditions upon which Parliament will sanction such supply, be inserted in any of the Special Acts of this session; but that, in the highly improbable event of the Committee agreeing to recommend any such conditions to

Parliament for their sanction, and such conditions being approved of by Parliament, they will be embodied in some General Act like the Gas-Works Clauses Act, and made applicable both to the Local Authorities and the Gas Companies alike in all parts of the country.

The Liverpool Lighting Bill, which is to be the foundation of these proceedings, is a Bill promoted by the Corporation for powers to supply the electric light for public and private purposes, and for the purchase of the Liverpool Gas Company's undertaking.

Clause 7 of the Bill says: "The Corporation may at any time within three years after the passing of this Act, by writing under their common seal, agree with the Company to purchase the undertaking of the Company, and the Company may sell to the Corporation," &c.

Clause 162 of the Public Health Act gives the same powers (with the sanction of the Local Government Board) without applying to Parliament. We may, therefore, conclude that the chief object of the Bill is to obtain powers to supply electric or other light for public or private purposes.

The provisions in the Bill for this purpose are as follows:—Clause 3. "It shall be lawful for the Corporation within the borough to supply light by means of electricity or other means, and for that purpose to exercise any of the powers hereinafter mentioned." Under the powers so mentioned, the Corporation might supply candles, oil, paraffin, methylated spirit, &c., with candlesticks, lamps, &c., for the use of the same.

I have carefully looked through all the Bills of the present session dealing with this question, to ascertain if they contained any provision as to price, and all except one (if my examination has been made correctly) propose to charge such price as the Company and the consumer may agree upon, and the exception is the Bill now under consideration—viz., the Liverpool Lighting Bill, which provides—Clause 4. "That the rent or sum to be charged by the Corporation for a supply of light for domestic purposes to any house or premises, shall not be greater than the average rent or sum which has been charged for the supply of gas to similar premises on the average for three years prior to the commencement of this Act," &c.

Comment on such a proposal is useless, as every one acquainted with the ordinary incidents of gas lighting must feel at a loss to conceive how such a proposal could have been seriously made; but so it is!

The Liverpool Gas Company intend to oppose the Bill, and I believe (though I am not authorized to speak on their behalf) that they intend to oppose in every possible way, and to the very last, all powers relating to the electric light, on the ground that they are wholly unnecessary, and our present knowledge of the subject is not sufficient to enable us either to make regulations, or prescribe conditions suitable to the case, or that might not, in twelve months hence, be wholly inapplicable; that, with our present knowledge only, such powers, if granted, could only be used as experiments, and such experiments ought to be made at the expense of the parties promoting the light, and not at the expense of the ratepayers.

If the Liverpool Company take this course, their evidence will tell as much against the granting of such powers to the Companies as to the Local Boards, and, on the other hand, if the Companies now promoting Bills with these powers decide to persevere in their applications, their evidence will tell as much for the Local Boards as for themselves. If, therefore, these Companies cannot agree among themselves upon some harmonious action with the others, before going into Committee, but persist in taking their own course, and thereby fighting the battle of their opponents, this end can scarcely fail to be prejudicial to the Companies generally.

The Liverpool Company have probably as large a capital at stake as that of all the other Companies seeking these powers put together, and no one would dispute the fact that they are as capable of managing a gas undertaking to the advantage of both themselves and their consumers as any company in the kingdom. Under such circumstances, as they entertain a very strong objection to any powers relating to electric lighting being granted to any one at the present time, it can hardly be expected that they will forego their opposition to the Corporation Bill in deference to the views of other Companies. It is, therefore, for the other Companies to consider whether, if they persevere in their applications, they have any chance of success; or, even if they succeed, will they do any good for themselves by taking this course.

If the Companies now promoting Bills with these powers can decide at once to strike them out of their Bills, they can give notice accordingly, and proceed with the other parts in the usual way; but if, regardless of the further experience acquired since the Bills were deposited, they still think it necessary to retain such powers, they must arrange among themselves as to under what regulations and conditions, and upon what terms, they will supply the electric light, and put them into some practicable shape for the Committee, keeping their several Bills back until the Committee have made their report. All things considered, the best policy for the Companies to adopt seems to be to withdraw all the powers relating to electric lighting from the Bills now pending; to agree upon some united action before the Committee; and, when the Committee have made their report, if any further action is deemed expedient, to use their united strength in getting some public general measure passed, affording the same relief to all. A provision in a special Act, authorizing a company to supply the electric light, would be a public notice to all purchasers of shares that a large allowance should be made for the contingency of the electric light some day or other superseding gas. Nothing could have a more prejudicial effect in undermining the solid foundation on which gas property now stands, than the introduction of these illusory powers as to electric lighting into the special Acts of the several Companies. Nothing in modern times has ever had such immense exertions made to keep it afloat as the electric light. The money spent upon it may be reckoned by tens of thousands, and the whole Press of the country, as with one voice, have spoken in favour of it. But, notwithstanding all that has been done and said in its favour, it has died out of itself, and it would be very unwise on the part of the Companies to do anything that would serve to keep alive the remembrance of it.

W. LIVESEY.

Gas and Water Companies Association, 6, Victoria Street, Westminster, S.W., March 8, 1879.

LOW-PRESSURE BURNERS.

SIR,—I have to claim your indulgence while I again put Mr. Sugg right as to who is entitled to the honour of first introducing low-pressure and slit-union (hollow-top) burners.

You report him to have said that "he believed his (the Sugg-Letheby) burner was the first in which gas was made to issue at a low pressure," &c., and your report is confirmed by that in the *Society of Arts Journal*. Your correspondent now says that he meant to have said "the first in which gas was properly consumed." The distinction is all-important. The first claims to have been the beginning of a long line of improvements, while the second only claims to have been a contributor to them—this being the proper position for the burner to assume. I must say, however, that the gas was not properly consumed by this burner, and this is proved by the fact that Mr. Sugg subsequently made two important improvements in the burner which he states did its work properly at the beginning. The fact is, the Argands were lagging behind, and the Sugg-Letheby burner was but a tardy following in the direction in which flat-flame burners had long before taken the lead.

Regarding the "hollow-top burner," you report Mr. Sugg to have claimed to be the inventor of it; and the *Society of Arts Journal* reports him to the same effect; while Dr. Wallace, in his reply, said that he was not aware that Mr. Sugg was the inventor of the "hollow-top burner," or he would have named the fact. Your correspondent now makes himself to have said that he "incidentally" stated that he was the inventor of the "hollow-top steatite burner." But he stated deliberately, and not incidentally, that he was the inventor of the "hollow-top burner," and clenched the statement by sketching the burner on the black-board.

If Mr. Sugg had simply claimed, in his original statement, the invention of the "hollow-top steatite burner," my first letter would not have been penned. But then I should not have been able to see where Mr. Sugg comes in as the inventor of anything. The hollow-top burner was in nearly every gas-fitter's shop. The steatite was being made into every other kind of burner but this one. Therefore, all that could be done by Mr. Sugg was to make the models, or send the existing burners to the steatite burner manufacturers. To call this an invention is playing with language.

Having now served my object, by showing how mythical are the grounds of Mr. Sugg's claims, I should have preferred stopping, but can scarcely do so because of the other matter your correspondent introduces into his letter. He deals with my statement that "we have no steatite burners made in England," by saying that "there is at the present time a large quantity in use," &c., which have been made at his works. The making of these cannot have been going on long, as, in the trial *Sugg v. Silber*, the plaintiff stated in evidence that his steatite burners were made in Germany. I take Mr. Sugg's statement to mean merely that he makes the rings for his large burners. Subject to his correction, I again assert that we have no steatite burners, properly so called, made in England, and that all the flat-flame steatite burners Mr. Sugg has sold—having exclusive virtues—have not been made by him, but have been procured from a source which is open to every one who likes to buy.

In the last paragraph but one of his letter, he becomes quite inquisitive, and I can well imagine Mr. Leoni smiling over that part which refers to him. Mr. Sugg asks permission to put three questions—viz., 1. What is the difference, if any, between Leoni's "adamas" and Bray's "enamel"? 2. Why he thinks the hollow-top burner should have its name changed to "slit-union"? Lastly, Whether he has found that "enamel" burners give better results in illuminating power than steatite or adamas?

My reply to the first is that I do not know of what Mr. Leoni's adamas is composed, and therefore do not know the difference between his and mine; and from the guess Mr. Sugg made, at Dr. Wallace's lecture, as to the composition of adamas, I should say that he knows nothing about either. I know they are both superior to steatite, because of the fractures invariably found in it, and the burners made from it, and its extreme brittleness when burned and cast to make into burners.

To the second, my reply is, the name "slit-union" was given because it is a slit burner, giving the same shape of flame as the union jet gives.

To the last query I answer that my enamel burners are not surpassed, in their several classes, by those of any other maker. As Mr. Sugg asks about the illuminating power (lighting power is the style I use) I may say that my highest lighting power burners yield more light for gas consumed than the steatite ones Mr. Sugg deals in.

GEO. BRAY.

Leeds, March 8, 1879.

MR. METHVEN'S PROPOSED PHOTOMETRIC STANDARD.

AN "AMENDE."

SIR,—"Leeks *is* goot," so says Fluellin; and although ungrammatically expressed, doubtless nothing can be truer. But the appreciation of the "gootness" of leeks must greatly depend upon the natural or acquired taste of the eater, and upon his freedom to elect the time and way of the eating. Under favourable conditions, I can readily believe that a leek may be as enjoyable as an apricot; but when, as in Ancient Pistol's case, the consumption of the vegetable in question is enforced by the persuasion of a cudgel and a broken pate, it may be fairly concluded, I think, that the article must be no more palatable than a bad egg. Well, there are, as indicated, differences in conditions—extending even to the cudgel. When one has the latter instrument in one's own possession, along with the leek, and nothing but one's own will is to determine whether the first is to be applied and the second swallowed, there need not, of necessity, be any pain or nausea excited. I am nearly in such a case; I have the cudgel and I have the leek. I have operated on my brain until I have become convinced that the comestible is "goot" and wholesome, so now sit down with satisfaction to dispose of it.

Mr. John Methven's paper "On a New Standard for Determining the Illuminating Power of Coal Gas" was read before the British Association of Gas Managers last June, and appeared in the JOURNAL under date of July 16 (p. 94). In that paper it was asserted "that portions of the flames of gases of varying qualities, ranging in illuminating power between 15

and 35 candles, consumed so as to effect perfect combustion by similar burners, are equal in illuminating power;" the burner employed being an Argand, while the portion of the flame transmitting its rays to the photometer disc or to the eye, was defined by a narrow vertical slit, at a fixed height, in an opaque screen, placed immediately in front of the burner.

In two letters published in the JOURNAL, under the dates of Aug. 6 and 20, 1878, I attempted, by reasoning, to show the unsoundness of Mr. Methven's position, and I still adhere to nearly all I said in those letters, and repeat that absolute equality in the light evolved from equal portions of two flames produced by the combustion of gases of different qualities is impossible. But the practical question is—Are the differences sufficiently great to render the proposed standard worthless? Or, to put the question another way—Are not the differences so small as to be almost, if not quite, unimportant? This question is the root—no, I mean the leek—of the matter. Mr. Methven said the differences were unimportant, and long since invited me to seek an experimental reply to the query; but neither his convenience nor mine permitted this to be done until Saturday evening last, when, in addition to ordinary gas, Mr. Methven was provided with a sample of what I saw to be rich cannel gas, but of what candle power I cared not to determine.

The slit in the opaque screen was intended to allow of the passage of as many rays of light from the Argand burner as would be equivalent to the lighting power of two average sperm candles of 120 grains per hour consumption each; but was, I was told, a little too wide, hence the readings of the value of the ordinary coal gas were lower than they should have been.

In the first and second sets of experiments, the ordinary coal gas was burned at the rate of 4·95 cubic feet per hour, and steadily maintained at that rate. The standard flame was adjusted on each occasion of changing from cannel to common gas, or *vice versâ*, to about 3 inches height, the adjustment being made quickly, and no very special care taken.

First Series.

Common gas as standard, illuminating power 7·03 candles.
Cannel gas as standard, illuminating power . 7·04 „
Difference, 1·3 per cent.

Second Series.

Common gas as standard, illuminating power 7·02 candles.
Cannel gas as standard, illuminating power . 7·38 „
Difference, 2·5 per cent.

Third Series.

Common gas reduced to 3·75 cubic feet consumption per hour.

Common gas as standard, illuminating power 4·01 candles.
Cannel gas as standard, illuminating power . 4·16 „

The mean difference in the three series of experiments is, therefore, 1·75 per cent., which, with 16-candle gas, would give an error of only 0·28 of a candle.

The object in reducing the gas consumption in the third series was to approximate to poor gas, and thereby get a bluer tint of colour on the disc. This was effected.

One remarkable fact is to be noticed, which is, that with cannel gas for the standard, a higher result is shown for the opposed flame. This was contrary to my expectations, and may possibly not always be the case. This remains to be proved by prolonged experiments.

The conclusion which I come to, after making these trials, which occupied from two to three hours, is, that the system is likely to be of much value to the gas maker; enabling him, as it does, to ascertain rapidly and nearly, if not absolutely, the lighting power of his gas. As a standard for public testing, I think it is not likely to find favour with "the powers that be," and for good and valid reasons which I will not now enter upon.

To render the application of the system easy, only a slight modification at the end of a Letheby photometer is needed, so that candles may be used when necessary.

I must qualify my admissions to a slight extent, by saying that experiments ought to be made to ascertain how coal gases down to at least 12-candle power serve the purpose intended, and also how mixtures of common and cannel upwards in power behave. I am inclined to believe that the results will be consistent with the statements made already. I may also observe that any absolute standard, equal to one or two candles light, is not essential with this system. Determine the value of the light emitted through the slit, and a multiplier can easily be found and used to correct observed indications thereafter obtained.

Well, the "leek" has been enjoyed by myself, and I am sure that my friend, Mr. Methven, will be ready to exclaim in his kindliness of heart, "May good digestion wait on appetite, and health on both."

55, *Millbank Street, S.W., March* 3, 1879. F. W. HARTLEY.

DOUGLAS (ISLE OF MAN) GAS COMPANY.—The eighty-eighth half-yearly meeting of this Company was held on Monday, Feb. 24—Mr. Killey in the chair—when the Directors report, which was read by the Secretary (Mr. J. Quinney), was, after a somewhat long and excited discussion, agreed to. Among other things it stated that for the half year ending Dec. 31 last, the net profit amounted to £2174 4s. 11d. The profit of the half year—notwithstanding the reduction in the price of gas made on Oct. 1 last—exceeded that of the corresponding period of 1877 by the sum of £217 7s. 9d. This increase arose from the exceedingly favourable purchase of coal, and also from the large increase derived from the sale of coke. The coke sales, notwithstanding a reduction at the rate of 22 per cent.—made Aug. 12 last—showed an increase of £133 11s. This arose from the greatly improved method of setting the retorts. During the current half year, the Directors will be compelled to make large and important additions to the general working plant. New condensers and scrubbers will have to be erected; a great number of street-mains will have to be taken up, and be relaid with new and larger pipes; and four beds of retorts will have to be taken down and re-erected, for which the Directors have concluded a contract. The Directors consider this a very favourable time to make these alterations, as they get the advantage of the unprecedentedly low iron market. The Directors conclude by stating that they are pleased to be in a position to announce a further reduction in the price of gas from the 1st of July next.

Parliamentary Intelligence.

HOUSE OF LORDS.

MONDAY, MARCH 3.

The following Bills were committed:—Dun Drainage; Dudley Sewage; Llandudno Improvement; Rathfarnham and Terenure Township; West Kent Main Sewerage.

Colwyn Bay and Pwllycrochon Estate Bill.—The Lord Chancellor acquainted the House that the further Standing Orders had been complied with.

A petition, praying that the Standing Orders might be dispensed with in the case of the Alliance and Dublin Consumers Gas Bill, was presented from Frontagers and occupiers of property abutting upon Great Clarence Street and Cardiffs Lane, Dublin.

Petitions against the following Bills were presented:—Colwyn Bay and Pwllycrochon Estate, from Guardians of the Poor of the Conway Union; Llandudno Improvement, from London and North-Western Railway Company; Rathfarnham and Terenure Township, from Owners, &c., of property within the districts of Rathfarnham and Terenure; West Kent Main Sewerage, from (1) Metropolitan Board of Works, (2) London, Chatham, and Dover Railway Company, (3) Dartford Rural Sanitary Authority, (4) Dartford Local Board, (5) Darenth Valley Main Sewerage Board, (6) Albemarle Cator, (7) Edward Henry Scott.

TUESDAY, MARCH 4.

Alliance and Dublin Consumers Gas Bill, Colchester Water Bill.—The Lord Chancellor acquainted the House that the Standing Orders not complied with, in respect of these Bills, ought to be dispensed with.

FRIDAY, MARCH 7.

Colwyn Bay and Pwllycrochon Estate Bill,—read a second time.

CONSERVANCY OF RIVERS.

The Duke of RICHMOND and GORDON, in presenting a Bill on this subject, glanced shortly at the previous course of legislation. As early as the reign of Henry III. this matter had been under the consideration of the Legislature, and it was interesting to find that their attention had been again directed to it in the time of Henry IV., Henry VI., and Edward IV. In the reign of Henry VIII., a most important measure was passed, dealing with the subject. That measure was the Statute of Sewers, and it was passed in consequence of damage from floods. Eight Commissioners were appointed under it, by the Lord Chancellor, the Lord Treasurer, and the two Chief Justices. They had powers of an unlimited character. They had absolute power of taxation and assessment, and if the regulations which they were empowered to make were infringed, they had power to award and inflict punishment for such infringement. That Act was now in force. Subsequent Acts had rather augmented than restricted the powers of the Commissioners. They were, it was true, restricted to a certain extent with respect to private rights, because, under certain of the Acts, new works were not to be undertaken, unless with the consent of the owners of three-fourths of the land. And so matters remained until the year 1861, when the Land Drainage Act was passed. That measure was really the first which placed restrictions on the Commissioners. By it the acts of the Commissioners were made subject to the authority of the Enclosure Commissioners. It was specified that no new works above the value of £1000 should be executed without the consent of one-half of the proprietors. Those Acts of which he had spoken were public Acts. But, in addition to these, there were no less than 2000 or 3000 local Acts, dealing with navigation, canals, and general improvement. These also materially interfered with the action of the Commissioners. Nor was that all the complication. There were Acts for dealing differently with different parts of the same river, which necessarily led to confusion. Under the circumstances, he thought their lordships would agree with him that, considering that the Act he had referred to had been passed no less than 300 years ago, that it was hampered and hedged in by hundreds of other local Acts (many of them framed for very different purposes, and dealing with antagonistic interests), and that the duties of the Commissioners were consequently complicated, it was not surprising to find at the present time that the channels of rivers were blocked up and obstructed, and that the lowlands were flooded because the water could not be carried off. In 1876 excessive floods prevailed in various parts of the country. The importance of the subject was impressed on the attention of the Government, and the consequence was that a Committee of their lordships House was appointed to consider the question. That Committee was asked to inquire how floods could best be prevented, and the obstruction of rivers avoided. A great deal of evidence was taken, and that evidence was gathered from various parts of the country, so as to arrive at some prevailing general impression. Having completed their evidence, the Committee adopted an unanimous report. In it they recommended that the area of each river should, as far as practicable, be placed under a single body of Conservators; that power should be given for removing obstructions, deepening the beds, dealing with the banks; that power should be given to enforce the Rivers Pollution Prevention Act, and that the rate for carrying out these objects should be levied over the whole watershed. The Committee were decidedly of opinion that towns and houses should contribute to the rate. He had gone into the question, and had found that out of the 210 rivers in England and Wales no two had a catchment basin or watershed alike. There were 11 rivers having an area of 1000 square miles, 14 with an area of 500, 59 with an area of 100, and from 50 to 100 with an area of 24. He thought he had shown sufficient grounds why there should be some legislation on this question. That opinion had prompted the Government to introduce the Bill which he would now lay on the table. The Bill would deal with four points—viz., the mode of establishing Conservancy Boards; the constitution of those Conservancy Boards; their duties; and, lastly, the mode in which the rate for their maintenance was to be levied. With respect to the first (the constitution of a Conservancy Board), power would be given to ten or more landowners in any district, or to any central authority, to apply to the Local Government Board for the purpose of having a Conservancy Board set up in the district. Upon any such application the Local Government Board should have power to direct a local inquiry to be held in the most public manner possible, due notice being given to all persons interested. After such inquiry, if the Local Government Board were satisfied that there were good grounds for the setting up of a Conservancy Board, a Provisional Order would be issued, giving power for that purpose. With the view of deciding as to the expense in doubtful cases, the promoters of the scheme for the establishment of a Conservancy Board would be required, if necessary, to appear before Parliament to sustain their proposal. Then came the question of the constitution of the new Conservancy Boards. He proposed that the Boards should consist of two descriptions of members—life members, and popularly elected members. Life members would be elected by one-third of the landowners of the district; and in the event of resignations or deaths, the vacancies would be filled up by the Boards themselves. The other members would be elected by the Sanitary Authorities for a period of three years. Such

would be the constitution of the Boards. Next came their duties. Their duties would be to cleanse, to embank, and widen the courses of rivers. Powers would be given to them to remove all obstructions they might think necessary. Powers would also be given to them to make bye-laws, make periodical surveys, and carry out the provisions of the Pollution of Rivers Act. The last, and most important duty of the Boards related to the question of finance. He proposed to give them powers to levy a general rate. For the purposes of rating, the land would be divided into three classes—uplands, intermediate lands, and lowlands. The rate to be imposed on the uplands would not exceed one-fourth of the whole rate, and power would be given to exempt certain lands, if such were thought to be desirable. Where it was clear that land had been improved by the drainage to be effected, it would be rated as if it had been a private improvement; but a power of appeal would be given to the Local Government Board. Some persons objected to the whole of a district being subject to the rate; but, in his opinion, there was no justice in such an objection. On the contrary, he thought it was only right that the whole of the district should be brought within the operation of the rate. Power would also be given to transfer the power of the local Acts to the new Conservancy Boards. These were the main features of the Bill. He hoped it would be found that the Government had dealt successfully with a complicated and very difficult subject. Perhaps it would be found that they had not been altogether successful; but they had endeavoured conscientiously to meet what they considered to be the justice of the case. Machinery would be provided by which each case would be judged by its merits. The initiative would be left to the Local Authorities. The importance of the question could not be overrated. Whether looked at from a sanitary point of view—from the good which it would do to the towns—or from an agricultural point of view, the subject of River Conservancy was a national one, and as such he commended it to their lordships favourable consideration.

The Marquis of RIPON acknowledged the importance of the question thus submitted. He thought the Government were right in dealing with it, and striving to get rid of some of the present complications. He would not now enter into the question of the constitution of the new Boards, but thought it might be matter for consideration whether it would not be advisable to adopt some simpler arrangements than those indicated by his noble friend. He rejoiced that by the Bill it was proposed to extend the operation of the Boards over the whole area of any particular district—a point on which the opinion of the House of Lords Committee were almost unanimous. There was one point on which he should like to have heard some explanation, and that was as to what the Government proposed to make the basis of rating for the purposes of the measure, the more especially as he supposed that both houses and lands would be affected by the rating clauses. He did not intend to offer any opposition to the principle of the Bill, and, with regard to its details, he felt sure it would receive from their lordships the most careful consideration.

The Duke of SOMERSET asked what would be done where there were several Boards along one river, as was the case with the Thames.

The Duke of RICHMOND and GORDON replied that the Thames was not included in the Bill; but in such a case as the noble Duke referred to, the Authorities would be united.

The Bill was then read a first time.

HOUSE OF COMMONS.

MONDAY, MARCH 3.

The following Bills were read a second time, and committed:—Brighton and Hove Gas; Gaslight and Coke Company; Glossop Gas; Leeds Corporation; Nottingham Water; Southend Water; Weardale and Shildon District Water.

The Examiner reported that the further Standing Orders had been complied with in the case of the following Bills:—Alliance and Dublin Consumers Gas; Colchester Water; Plymouth and Stonehouse Gas.

Nelson Local Board Bill.—A petition, praying that the Standing Orders might be dispensed with in the case of the petition of Messrs. Towneley, Parker, Holden, and Briggs, was presented.

Petitions against the following Bills were presented:—Brighton and Hove Gas, from (1) James Martin Carr Lloyd, (2) Hove Commissioners, (3) Vere Fane Benett-Stanford and others, (4) Owners, &c., of dwelling-houses within 300 yards of gas-works in the parish of Portslade; Dearne Valley Water, from Earl Fitzwilliam; Manchester Corporation Water, from (1) West Cumberland Consols, Limited, (2) Water Joint Committee of the Leigh and Hindley Local Boards, (3) William Henry Wakefield, (4) Lieut.-Col. Rhodes (against clauses); Nelson Local Board, from Messrs. Towneley, Parker, Holden, and Briggs; Newcastle-upon-Tyne and Gateshead Gas, from North-Eastern Railway Company.

TUESDAY, MARCH 4.

Bromley Gas Bill, New River Company Bill.—The Examiners reported that the further Standing Orders had been complied with.

Petitions against the following Bills were presented:—Alliance and Dublin Consumers Gas, from Grand Canal Company; Belfast Water, from Owners and occupiers of property in Belfast; Manchester Corporation Water, from (1) Richard Henry Ainsworth, (2) William Wakefield, (3) Countess Ossalinsky, (4) Thirlmere Defence Association, (5) Earl of Bective and Thomas Grassyard Edmondson, (6) John James Spedding and others.

WEDNESDAY, MARCH 5.

Portsmouth Water Bill, Rotherham Borough Bill,—read a second time, and committed.

THURSDAY, MARCH 6.

Petitions against the following Bills were presented:—Leeds Corporation, from John De Morgan; Manchester Corporation Water, from James Ormrod, William Gray, and William Hargreaves (against alterations).

Petitions (the petitioners not praying to be heard) against the Lower Thames Valley Main Sewerage Board Bill were presented from (1) Owners, lessees, and occupiers of lands and houses in Hampton Court, (2) Ditto in East Molesey, (3) Ditto in West Molesey, (4) Ditto in Esher, (5) Ditto in Thames Ditton, (6) Owners of property (against second reading), (7) Owners, &c., of property in Walton (ditto).

A requisition to withdraw their petition against the Nottingham Water Bill was presented from the Corporation of Nottingham.

Mr. WATNEY gave notice that on the second reading of the Lower Thames Valley Main Sewerage Board Bill, which was fixed for Friday, March 7, he would move—"That the Bill be committed to a Select Committee of eleven members, six to be appointed by the House and five by the Committee of Selection: That all petitions against the Bill be referred to the Committee; and that such petitioners as pray to be heard by themselves, their Counsel or Agents, be heard upon their petitions, if they think fit, and Counsel heard in favour of the Bill against such petitioners."

FRIDAY, MARCH 7.

A petition praying that the Standing Orders might be dispensed with in the case of the petition of Owners, lessees, and occupiers, against the Belfast Water Bill, was presented.

Petitions against the following Bills were presented:—Alliance and Dublin Consumers Gas, from Corporation of Dublin; Leeds Corporation from (1) Great Northern Railway Company, (2) London and North-Western Railway Company, (3) North-Eastern Railway Company; Rotherham Borough, from Midland Railway Company.

The CHAIRMAN of WAYS and MEANS gave notice that on the second reading of the Liverpool Lighting Bill, which is fixed for Monday, March 10, he would move—"That the Bill be committed to a Select Committee of seven members, four to be appointed by the House, and three by the Committee of Selection: That it be an instruction to the Committee that they have power to inquire into the suitability of the electric light, and of any schemes for lighting by electricity or other improved methods, for use in thoroughfares and other public places; to consider how far, and under what conditions, the use of such modes of lighting should be sanctioned by Parliament in the case of Municipal Corporations, other Local Authorities, or Public Companies, and to report their opinion to the House; and that such of the petitioners against the Bill as pray to be heard by themselves, their Counsel or Agents, be heard upon their petitions, if they think fit, and Counsel heard in favour of the Bill against such petitions: That the Committee have power to send for persons, papers, and records: That four be the quorum of the Committee."

MORTALITY IN THE METROPOLIS.

Dr. LYON PLAYFAIR gave notice that on an early day he would "draw attention to the increasing mortality of the Metropolis, especially from zymotic diseases; to the continued impurity of the Thames, from which the Metropolitan water supply is largely derived; to the urgent necessity of preventing the pollution of that river; and move a resolution."

LOWER THAMES VALLEY MAIN SEWERAGE BOARD BILL.

Mr. GORST, in moving the second reading of this Bill, said the object of the measure was to confirm a scheme that had been promoted by a public body, created by Parliament, consisting of thirty-three members, elected by the ratepayers of the district, for the express purpose of satisfactorily disposing of the sewage of an extensive district in the western part of the Metropolis, and prevent its flowing into the Thames. One parish within the district had incurred fines and penalties to the extent of many thousand pounds, because it was unable to dispose of its sewage. The Board were bound, by the Act which created them, to provide for the disposal of the sewage of the district within three years, and to dispose of it without creating a nuisance. In the second place, they were not to pollute the Thames. Twenty-three schemes were submitted to the Board, sitting at Kingston-on-Thames, and the one selected was embodied in this Bill. Unfortunately, the scheme was opposed by influential persons, who were the constituents of the elected Board, who did not like the locality where it was proposed to deposit the sewage. He hoped the House would accede to his motion.

Mr. ISAAC said he felt a great responsibility in rising to move the rejection of the Bill. Evidence had been taken before a Committee in the House of Lords which showed that the opposition was valid and legitimate. The scheme embodied in the measure involved the acquisition of some 30 or 40 square miles within the Lower Thames Valley district, to be used as a sewage farm, and this proposal had been condemned before the Committee he referred to, by two Engineers of great eminence, employed by the promoters of the scheme. The Sewerage Board had had ample opportunities of carrying out the works, by applying, through the proper channel to the Local Government Board, instead of bringing a Bill before the House. The question would thus have been dealt with by a Provisional Order, and the ratepayers of the district would have had an opportunity of raising any question with regard to the action of the Sewerage Board when the question arose of dealing with the sewage. If the Bill were read a second time, all inquiry would be prevented. The land it was proposed to use for disposing of the sewage was very often flooded, and always water-logged, and there were serious objections connected with the cost of the scheme. He concluded by moving that the Bill be read a second time that day six months.

Mr. GILES opposed the second reading of the Bill, on the ground that it would authorize large quantities of sewage to be poured upon land which was continually being flooded, and that thus the sewage would find its way into the Thames. The scheme was an incomplete one, and should be stopped at once.

Sir A. LUSK supported the second reading of the Bill, which he considered was an attempt on the part of a public body to fulfil the obligation that had been imposed upon them by Parliament, of stopping the flow of sewage into the Thames. If the measure were not allowed to be sent to Committee, the sewage of 108,000 persons must continue to be poured into the river.

Sir W. BARTTELOT objected to the Bill, not because a remedy ought not to be found for what was admittedly a crying evil, but because the Government should take the responsibility of declaring in what way this difficult question ought to be treated. If the Bill were referred to a Select Committee, all persons interested in the question, except the owners of the land, would be prevented from having a *locus standi* before the Committee.

Mr. SHAW-LEFEVRE urged the House to allow the Bill to be referred to a Select Committee, as the promoters desired simply to perform a public duty, and had no personal interest in the question.

Mr. SCLATER-BOOTH did not feel called upon to state the views of the Government upon this question; but remarked that a Bill promoted by a body representing, after a very recent election, a larger number of the ratepayers of the Metropolis, was entitled to very careful consideration. The question was, whether the House would take upon itself, on mere *ex parte* statements, to put a stop to the measure, which was a *bonâ fide* attempt to perform the obligations cast upon the promoters by Parliament. After the Bill had gone through the ordeal of a Select Committee, it might be time to decide whether it should pass into law or not; but that was a very different question from saying that it should not go before the Committee. Personally, he should feel it his duty to vote for the second reading.

Mr. HERSCHELL observed that the neighbours and owners of property around this sewage farm would be seriously prejudiced, and would clearly have no *locus standi* before the Select Committee; and before the House agreed to refer the Bill to a Committee, it ought to be satisfied that the scheme proposed was the only practicable one.

Mr. RAIKES submitted that great consideration was due to a Bill promoted by a public body called into existence by a recent Act of Parliament. There were some special circumstances with regard to this Bill which had not occurred before, and there was one important question which was sure to occur again—namely, the public question which related to the compulsory acquisition, for sewage purposes, of a large tract of land covering from 600 to 700 acres. The proposal was one affecting the health of a large population, and required delicate treatment. The reason why Bills were sent to a Committee upstairs was that the parties interested might be heard, and that plans might be submitted which would assist the judgment of the Committee; but this was a case in which the parties most interested could not be heard, because the Drainage Board was the indirect, and not the direct outcome of popular election. The opponents of the Bill were fighting the Bill wholly in the dark; they were quite unaware of the

particular mode in which the sewage was to be dealt with. Out of twenty-five plans, the promoters of the Bill had selected one which it was necessary to submit to Parliament. Had they adopted any of the other twenty-four plans, they might then have gone to the Local Government Board and obtained the services of an inspector—a gentleman of great knowledge and experience in these matters—who would have held an inquiry, at which every one of the ratepayers would have had a *locus standi*. No case had ever appeared to deserve the deliberate judgment of the House more than this one. The House was in a good position to afford that judgment, and if the Bill went to a division he, for one, should vote against the second reading.

Mr. CHILDERS suggested that the Bill should be read a second time, and then be referred to a hybrid Committee, before which body all persons interested in the subject could be heard.

Lord G. HAMILTON said that if it was true that those whose property was affected by this Bill could not be heard before an ordinary Committee, the objection might be met by referring it to a Committee of eleven members. Four or five years ago, a statute was passed by which all the Local Authorities in the Lower Thames Valley were combined together for the express purpose of meeting a difficulty which was not of their own creation, but the direct result of an Act of Parliament. They took an enormous amount of evidence, and deliberately selected, out of 23 schemes, that which they considered the most likely to meet this exceptional difficulty. It would be the reverse of encouraging to the gentlemen who served on the Board if the House were now to ignominiously reject their proposal.

Mr. WATNEY said that if the sewage was not dealt with in the way proposed by this Bill, it must be thrown into the Thames. He hoped the Bill would be read a second time, and be referred to a hybrid Committee.

Serjeant SPINKS reminded the House that of the 33 members of the Board, 27 had voted on this question, and that the majority of 15 who carried the scheme did not constitute an absolute majority of the Board which was appointed to consider this most important subject. He thought it would be better for the House at once to reject the Bill, which, if passed into law, would endanger the health, and ruin the property of large numbers of people.

The House divided, and the numbers were—

For the second reading	146
Against	168
Majority against	22

The Bill was therefore rejected.

SATURDAY, MARCH 8.

Petitions against the following Bills were presented:—Alliance and Dublin Consumers Gas, from Dublin Port and Docks Board; Rotherham Borough, from (1) Earl Fitzwilliam, (2) Rawmarsh Local Board.

Legal Intelligence.

HIGH COURT OF JUSTICE—CHANCERY DIVISION.

THURSDAY, FEB. 27, 1879.

(*Before Justice* FRY.)

GLOSSOP *v.* HESTON AND ISLEWORTH LOCAL BOARD.

This was a case in which Vice-Chancellor Malins granted a perpetual injunction on June 4, 1878, restraining the defendants from polluting a certain stream. His lordship, however, said the injunction would not come into operation until December. The defendants then moved for further time, which the Vice-Chancellor granted them.

Mr. HIGGINS (with whom was Mr. METHOLD) now moved that the injunction granted by Vice-Chancellor Malins might not come into force until the appeal was disposed of.

Justice FRY, without calling on the plaintiff's counsel, refused the motion, with costs.

CENTRAL CRIMINAL COURT.—TUESDAY, MARCH 4.

(*Before Commissioner* KERR.)

THE METROPOLITAN PURE WATER SUPPLY ASSOCIATION FRAUD.

James William Parker, 63, clerk, was indicted for obtaining various sums of money by false pretences.

Mr. STRAIGHT prosecuted; Mr. KENNEDY defended.

In this case the prisoner had, for a number of years, been collecting money on behalf of the Metropolitan Pure Water Supply Association, a Society which, he said, had been formed for the "purpose of providing the Metropolis with a pure and constant supply of water." When arrested he had upon him lists of subscriptions extending back to 1866. The prisoner represented himself as Secretary of the Association; but, beyond papers having been left at the office of the Registrar of Joint-Stock Companies, the Society appeared to have had no existence. It had no registered offices, and at the addresses which were supplied the prisoner and the Association were not known.

The JURY found the prisoner "Guilty," and he was sentenced to 18 months hard labour.

SLOUGH PETTY SESSIONS.—WEDNESDAY, MARCH 5.

(*Before Messrs.* THOMSON, WATSON, *and* THOMPSON.)

POLLUTION OF THE COLNE.

Mr. *G. Wood*, of the Wraysbury Paper Mills, was summoned for causing the River Colne, within three miles of the Thames, to be polluted.

Mr. G. TERRELL represented the Conservators; Mr. H. DARVILL, of Windsor, appeared for the defendants.

Mr. TERRELL stated that the proceedings were taken under the 63rd section of the Thames Conservancy Act, 1866, which imposed upon the Thames Conservators the duty of preserving the purity of the Thames and its tributaries. The Conservators gave permission to certain Companies to draw water from the Thames, and, in consideration of an annual payment, they undertook the duty of keeping the river clean. A notice had been given to the occupier of the Wraysbury Paper Mills to construct certain works to prevent the pollution of the River Colne at Wraysbury, since which the present defendant had come into occupation. As he had promised to construct the necessary works, he (Mr. Terrell) proposed, with the permission of the Bench, to withdraw the summons.

The Magistrates assented, and the summons was accordingly withdrawn.

BELPER GAS COMPANY.—The half-yearly meeting of this Company was held on Tuesday, the 25th ult.—Mr. I. Hanson presiding. On the motion of Mr. Pym, the accounts, as read by Mr. Ingle, the Secretary, were adopted. Mr. J. Smith moved that the usual dividend for the half year, after the rate of 10 per cent. per annum, be declared. This was unanimously agreed to. Mr. S. Watson and Mr. J. Smith were elected Directors of the Company, in the room of Mr. S. Kiddy and Mr. W. E. Webster; and a vote of thanks was accorded to the Chairman, the Directors, and the Auditors, for their past services.

Miscellaneous News.

METROPOLIS WATER SUPPLY.

The following are the returns of the Society of Medical Officers of Health on the Composition and Quality of the Metropolitan Waters in February, 1879:—

Names of Water Companies.	Total Solid Matter per Gallon.	Oxygen required by Organic Matter, &c.	Nitrogen. — As Nitrates, &c.	Ammonia. — Saline.	Ammonia. — Organic.	Hardness (Clark's Scale). — Before Boiling.	Hardness (Clark's Scale). — After Boiling.
Thames Water Companies.	Grs.	Grs.	Grs.	Grs.	Grs.	Degs.	Degs.
Grand Junction	22·10	0·061	0·189	0·000	0·007	14·3	4·6
West Middlesex	22·00	0·047	0·180	0·000	0·009	13·2	4·6
Southwark and Vauxhall	21·70	0·036	0·150	0·000	0·008	13·2	3·3
Chelsea	22·20	0·062	0·135	0·000	0·007	13·7	3·7
Lambeth	21·70	0·087	0·135	0·000	0·006	13·2	3·3
Other Companies.							
Kent	30·90	0·002	0·360	0·000	0·003	18·8	6·5
New River	22·40	0·032	0·180	0·000	0·006	14·3	3·7
East London	26·00	0·062	0·180	0·000	0·007	16·5	4·6

Note.—The amount of oxygen required to oxidize the organic matter, nitrites, &c., is determined by a standard solution of permanganate of potash acting for three hours; and, in the case of the Metropolitan waters, the quantity of organic matter is about eight times the amount of oxygen required by it.

The water was found to be clear and nearly colourless in all cases.

C. MEYMOTT TIDY, M.B., &c.

DERBY GAS COMPANY.

The Fifty-fourth Half-Yearly Meeting of this Company was held on Friday, the 28th ult.—Mr. G. GASCOYNE in the chair—when the balance-sheet, which was presented for the half year ending last December, showed that the receipts, including £17,553 6s. 5½d. for gas and meter rents, amounted to £22,636 11s. 2½d., and, after the payment of all expenses, there remained a profit of £7021 0s. 3½d. It was proposed to divide this sum as follows:—Dividend on 2400 original shares, at £1 5s. per share, £3000; on 2400 new shares, at 17s. 6d. per share, £2100; undivided profits, £1921 0s. 3½d.

The CHAIRMAN proposed that the balance-sheet be received and inserted in the books of the Company. He said the balance of £1921 which they carried over, after paying the usual dividends of 10 and 7 per cent., was very satisfactory, but it probably would not be as much so on the next occasion, as they had allotted 800 new shares for the conversion of the bonds, and that to some extent would reduce the amount of surplus in future. He was glad to see so large an attendance of Shareholders, as it showed that the interest they took in the Company at the last moment was no less satisfactory than it had been all along. They were exceedingly indebted to their able Engineer, not only for the solidity and perfection, but he might almost say the grandeur of their new works, which were a model to all. Their Chief Engineer (Mr. T. Hawksley) was present, and it was only due to him, under all circumstances, to express the satisfaction of the Shareholders at the excellence of the works, which had produced such satisfactory financial results, as all his works everywhere did. The extensions which had been made of their works were very necessary. The supply of gas was becoming very large. He was informed by Mr. Taylor, their Manager, that the manufacture was one-sixth larger last year than it was before. They should, therefore, have to make provision, and that right early, for a considerable increase of retort-room, and that might mean a new retort-house and other accompanying expenditure of some importance, which could not be delayed—that was if they were to retain the supply of gas in their own hands, which he hoped they should for a considerable time longer, and, if so, they must keep their engagements. Some outlay might, therefore, be anticipated; but the revenue was quite in a position to meet it. He could say nothing more than that the Company were in a very creditable, prosperous, and efficient state, and he was thankful to be able to make that remark.

Mr. HASKEW seconded the resolution, and it was carried.

Messrs. Cramond, Cooper, and Jefferson were then re-appointed Directors, and Mr. Swingler was elected an Auditor; and votes of thanks were passed to the Chairman, Directors, and Officers.

The CHAIRMAN replied.

Mr. HAWKSLEY also returned thanks. He commenced by thanking the Chairman and the meeting for the very handsome manner in which he had been spoken of, but he said he had more pleasure in appearing on behalf of the many efficient officers, from whose great attention the Company derived greater and more immediate benefits than anything they gained from him. His duties in some respects were unfortunate. He had to spend their money. Those gentlemen had to see that what he spent was reproductive for the benefit of the Shareholders; and if it were not for them, and their constant attention and great exertions—if it were not for their immensely acquired experience in the Company's service—the Shareholders would not obtain those handsome, and, if he might so express it, persistent dividends which they now enjoyed. He was happy on one other account to differ, though in the smallest possible degree, from the observations of their Chairman. The Chairman had told them that they were on the eve of another considerable expenditure, and that they might expect some reduction in the handsome surplus which the balance-sheet announced. He disagreed with the Chairman in that particular. No money had ever been spent, that he was aware of, that had not tended rather to increase their profits than to diminish them; and they had only to consider this, that the profits had necessarily increased, because they had been able to make frequent reductions in the price of gas supplied to their customers. Derby was supplied with a most excellent article, and that article was delivered at a very low price; and nothing, he was sure, could be better or more satisfactory than that form of management which private enterprise had in the present instance so beneficially displayed. For his own part, he would not have alluded to the subject, but the Chairman had just touched upon it, and he should be as brief as the Chairman. He was one of those persons who did not believe in the benefits of communistic efforts. He believed in the advantages of private enterprise; and he hoped the establishment in which he and his friends and family were largely interested would continue *in perpetuo* in their hands, and be as beneficial to themselves as it had been, and still was. One word he would say with regard to the expenditure, which might, perhaps, both interest and surprise them; that was, that they did not lay down a cartload of bricks for any enlargement of their undertaking, but it produced 1000 feet of gas more, and they received the profit of it. If they made a large expenditure, they obtained a proportionate profit. They had opportunities—and they were few enough in the present day—of making beneficial and safe investments. If it was in his power, and there was good cause for it, to make their case not the work of £170,000, but the work of £1,000,000, so much the better for them, and so much the better

for everybody; because, if the £1,000,000 was laid out advantageously, they became the owners of that property which that money would create, and, therefore, the expenditure, so long as it was not lavishly made, was good for everybody—good for the town, because the article which that expenditure enabled to be produced was wanted, and good for the Shareholders, because it afforded them an outlet for their money, and because the money so laid out produced a commensurate return.

Mr. CRAMOND said there had been a great scare in some quarters respecting the electric light, and he was sure the meeting would be glad to have Mr. Hawksley's views on the subject.

Mr. HAWKSLEY said he was very happy to give his views on the subject, but he would rather state something better than his views, and that was his practice. He had bought up all the gas shares which his means would allow, because he believed the electric light, the more he saw of it, was nothing but a phantom, and that it would not affect gas property the least in the world. Though it would take its place as an illuminator, that place would be a very small one. It was more, under one set of circumstances, a toy, and under other circumstances a gaud, than anything else. Electricity could be made useful for special purposes. It was good for lighthouses; it was good, under certain circumstances, for very large establishments. It might be made—although he had something to tell them upon that subject—available for such places as the Albert Hall, in London, where they wanted to make a brilliant appearance and startle the people, and make a room very attractive, and all that sort of thing—to draw custom, in point of fact. Under those peculiar circumstances the light, no doubt, would be useful. But it was not divisible, or, at least, not to any extent, and it was not a manageable light, and never could be made so. Electricity was, of all things in the world, that one thing which was most untractable, and which was always trying to make its escape, like the Irishman's pig, in the wrong direction. Another thing was the question of cost. It was a very dear light, and they never could make it cheaper. They could make it upon the lecture-table, and they might convey it a few yards—a few hundred yards—not with economy, but without enormous expense. But it could not travel far. The leakage of gas was nothing to the leakage of electricity, and he might tell them that in the calculations which were made with respect to the cost of electricity, they entirely forgot, that if it should ever—and he would assume it would—come into use in the same manner as gas, they must have a complete establishment, with collectors, inspectors, bookkeepers, engineers, and all sorts of people, involving a very large staff, indeed; and they must, somehow or another, measure the value of the article; they must meter it, and they never had been able to find a way of doing that, and, probably, never would. But they entirely forgot the very large expense, including rates and taxes. Every foot of wire would be rated exactly as every foot of pipe was rated. They left all these things out of the calculation, and they forgot also the dividend. There was no proviso for dividend. They only told the cost; and, when they did that, the best of them could not make it less than four, five, or six times the cost of gas. He thought, therefore, gas was not at all likely to be injured by the introduction of electricity. It might be that some people would assume a public body, and might want to stick out matters for the purpose of display, and to show that the light was doing something. They might have a big electric light in the Market Place. Let them. Why should they not? They would have to put up steam-engines, and employ men to work the apparatus, and then they must run about with farthing candles every now and then, for it was a very fitful thing, and they would find that it went out, and left them, from being immersed in a too dazzling light, in stark staring darkness. In no way or form need a gas company apprehend any diminution of their supply or any decrease of their profits, because that very wild, and he was afraid very speculative man, Mr. Edison, had been so good as to throw a large portion of the weak-minded and weak-kneed people, who had held gas property, in a state of despair with regard to their interests. The scare had benefited him, and he hoped would benefit them all.

The CHAIRMAN expressed the thanks of the meeting to Mr. Hawksley for his very serviceable and interesting *exposé*.

Mr. MARSDEN said those who brought forward the electric light did not tell them how much they would want by way of royalty, and they had left out of their calculation what gas companies could do in the way of competition, by reducing the price of their article, and still secure a handsome profit.

The meeting then terminated.

EASTBOURNE GAS COMPANY.

The Ordinary Half-Yearly Meeting of this Company was held on Monday, the 24th ult.—Dr. G. A. JEFFERY in the chair—when the following report was presented:—

The Directors have to report that all the contracts for the enlargement of the works have been completed, and it is thought that their capacity is now sufficient to meet whatever demand may be made upon them for many years to come.

It will be seen, from the annexed accounts, that in carrying out the extensions a sum of £14,505 16s. 5d. has been expended during the past six months, leaving a balance in hand on capital account of £772 19s. 6d.; but, inasmuch as a considerable sum of money is still due upon several contracts, it will be necessary to raise fresh capital, by way of loan, to clear off the liabilities that will accrue on that account until such time as power is obtained from Parliament for increasing the present nominal share capital of the Company, which now stands at £50,000.

The manufacture of sulphate of ammonia, from which the Directors hope to derive a good revenue, has already commenced on the works.

The contract for the supply of gas coals will expire in May next, but the Directors have under their consideration an offer of a renewal for a further period of two years, upon more favourable terms.

The price of gas is now 4s. 7d. per 1000 cubic feet.

The revenue account still preserves its elasticity, and, notwithstanding that it shows a deficit of £1255 1s. 2d., there will be, after taking into account the amount of stock and the quarterly accounts for gas consumed to Jan. 1, 1879, the cost of producing which has been charged in the revenue account, and making provision to meet all claims against the Company, an available balance of £2680 7s. 7d. The Directors, therefore, recommend that a dividend at the rate of 10 per cent. per annum be declared and paid upon the £20,000 original capital of the Company, and a dividend at the rate of 7 per cent. per annum upon the £30,000 capital in B shares, which will absorb about £1950 of the aforesaid balance.

The CHAIRMAN, in moving the adoption of the report and balance-sheet, alluded to the electric light as a matter whereby the Company, in common with similar undertakings, had lately been scared, but which, he maintained, was not likely to come into competition with gas. A consideration of the question must reassure the Shareholders as to the value of the light they possessed. There was a bare possibility of the electric light supplanting gas, and the gas companies ought to improve the illuminating power of their gas, and supply it cheaper. Their Company had spent large sums of money in improving the works, adopting improved appliances for the distribution and purification of the gas, and had, to some degree, cheapened the price. By-and-by they might hope to reduce its cost still further. He thought, however, that they ought to receive for their investment as much as, or nearly 10 per cent. Gas-making was only in its infancy. He would advocate its use for cooking and warming purposes, in which he had found it very useful. He would suggest to the Park and Pier Companies that they should put up some of Sugg's lamps, like those used in Waterloo Place and Regent Street, London, and acknowledged to be far superior to the electric light on the Embankment and at other places. To the Public Authorities he would say, "Double your gas-lamps, or have lamps of 50, 60, or 200 candle power." He should say good-bye to the electric light as the light of the future. Gas was the light of the present, and would continue to be used if gas companies took care. The other was the light of a to-morrow which would either never come, or be in the very distant future.

Mr. HILLMAN seconded the motion.

The CLERK, in answer to a question, said that the loss arising from the falling in of the nearly completed new gas-tank, about a year ago, had been about equally shared by the Contractors and the Company.

Mr. WRIGHT (Sub-Manager of the Brighton Gas Company's works) called attention to one or two matters in the revenue account. There was only a very small item for sale of liquor, £15, though 5400 tons of coal had been used. Of the resulting tar also, only a moiety was accounted for by the sales. He said he should hope that whatever the Company did with their liquor they did not waste their tar. He knew there were some very convenient ditches near the works, but if they received any tar, the Local Board would surely check the waste for their own sake. He asked whether the Company had been able to produce sulphate of ammonia.

The CHAIRMAN said they had produced some very fair specimens, but not sold any. Some had been sent to London to be valued.

Mr. WRIGHT, of the Clerk's Office, said that the Company had been offered £18 per ton.

The CHAIRMAN added that the manufacture was not in an advanced stage. The Manager (Mr. Isaac Winchester) had been sent to London to look into the working of the process.

The adoption of the report and balance-sheet was then unanimously resolved on, and, after the usual vote of thanks to the Officers, the meeting terminated.

SOUTH SHIELDS GAS COMPANY.

The Annual Meeting of the Shareholders was held on Thursday, the 27th ult.—Mr. R. WALLIS in the chair.

The SECRETARY (Mr. J. H. Penney) read the notice convening the meeting, and the following report and statement of accounts were submitted:—

Annexed are the accounts and balance-sheet of the Company, duly examined and signed by the Auditors.

The result of the working for the half year ending Dec. 31, 1878, is satisfactory, notwithstanding the depression in all branches of industry. Your Directors recommend the usual dividend of 4½ per cent. on the old capital, and 3½ per cent. on the new capital of the Company.

The increase in the consumption of gas shows a steady improvement of above 10 per cent. over the corresponding period of 1877. The illuminating power has been maintained at an average of 15·26.

Your Directors have the pleasure to report the favourable progress of the Bill to come before Parliament. At the meeting of Shareholders held on the 7th inst., for the purpose of considering the Bill, it was approved of by 31 Shareholders, representing £33,383 capital.

Your Directors retire from office, and are eligible for re-election. Mr. Robert Chapman is the retiring Auditor, and is also eligible for re-election.

Dr. *Half-Yearly Profit and Loss Account, ending Dec. 31, 1878.* Cr.

Balance from June, 1878		£2,976 16 11	Dividend on A stock		£1,800 0 0	
			Do. B stock, and new calls		1,051 12 2	
			Balance carried down		125 4 9	
		£2,976 16 11			£2,976 16 11	
Balance down		£125 4 9	Stock of coal, coke, tar, &c., from June		£1,698 6 4	
Half year's gas and meter rental (net)		12,573 13 6	Coals and cartage		3,529 5 4	
Sale of coke		1,001 0 2	Wages and superintendence		3,158 7 8	
Ditto tar		538 12 5	Salaries (Office)		265 0 0	
Profit on ammonia		688 2 9	Ditto (Collectors)		120 0 0	
Corporation upholding public lamps during half year		243 4 10	Rents		176 6 11	
Service charges, fixing meters, &c.		67 18 11	Rates		587 9 0	
Stock of coals, coke, tar, iron, and sundries		1,788 4 2	Directors, Auditors, and Scrutineers fees		143 17 0	
Transfer fees		1 5 0	Lime		120 2 11	
			Water		60 15 1	
			Retorts, bricks, &c.		253 6 4	
			Service-pipes, gas-cocks, iron, steel, and tin goods		467 3 5	
			Castings		46 4 7	
			Cartage		211 11 8	
			Paving		85 2 1	
			Stationery, printing, &c.		70 5 5	
			Incidentals and miscellaneous		348 4 5	
			Paints, oils, &c.		113 8 9	
			Wear and tear—maintaining and relaying mains, &c.		788 4 5	
			Interest on loans, &c.		427 9 3	
			New meters		248 8 9	
			Repaired meters		64 6 0	
			Repairs		250 8 4	
					£13,254 13 6	
			Balance to profit		3,772 13 0	
		£17,027 6 6			£17,027 6 6	

Balance-Sheet.

Proprietors capital—			Plant, works, &c., as per last statement		£62,476 5 4
A stock	£40,000 0 0		Extensions and new mains during half year		553 9 2
B "	20,000 0 0		C. Powis and Co., for sawing machine		27 18 6
New	15,750 0 0				£63,057 13 0
	£75,750 0 0		Less wear and tear—maintaining and relaying mains, &c.		788 4 5
Loan capital, mortgages, and bonds	17,700 0 0				£62,269 8 7
Revenue account, balance of profit	3,772 13 0		New works in progress at Jarrow		26,855 3 7
Sundry accounts owing for coals, lime, iron goods, &c.	2,780 10 4		C. and W. Walker, on account of contracts		1,763 1 3
J. & E. Joicey, for land and quay	£5,850 0 0		Land and quay	£6,500 0 0	
Less paid on account	850 0 0		Less old material sold	1,372 16 3	
	5,000 0 0			5,127 3 9	
Deposits for gas	1,188 9 2		Parliamentary expenses		101 19 3
Reserve-fund	6,373 10 4		Horses and carts	£882 9 6	
Dividend on £5811 15s. 3d., invested in 3 per cent. Consols	91 14 7		Less profit	597 0 1	
Balance due to bankers	2,695 18 9			285 9 5	
			Stock of horses food	11 6 0	
			Do. acid	12 17 10	
			Do. coals, coke, tar, &c.	1,788 4 2	
			Consumers gas account, inclusive of quarter due Dec. 31	9,874 5 4	
			Sundry accounts owing for coke, tar, &c.	1,370 9 8	
			Reserve-fund invested in 3 per cent. Consols	5,811 15 3	
			Cash in hand	81 12 1	
	£115,352 16 2			£115,352 16 2	

The CHAIRMAN said he was proud to see so large and influential a meeting; and, considering that they had met together so recently, he thought the pro-

ceedings would be little more than formal. He, therefore, had great pleasure in moving that the report and balance-sheet be adopted, and he trusted that all would be satisfied with it. It was evidently a very favourable statement, when they considered the depressed state of trade, and bearing in mind the fact that they had made a reduction in the price of gas last year, he considered that their receipts had been far beyond their expectation. The total receipts for the half year, inclusive of the small balance brought down from last half year, had been £17,027 6s. 6d.; the total payments had been £13,254 13s. 6d.; leaving a balance of £3772 13s., out of which to pay dividend and interest. There had been a small decrease in the rental as compared with the corresponding period of last year. This was owing to the reduction of 3d. in the price of gas, which the Directors made in January last year, and a further reduction of the price charged at Hebburn, from 4s. to 3s. 3d., less the usual discount, which took effect in September last. There was, however, one gratifying circumstance—namely, that there had been an increase of 2,203,200 cubic feet in the consumption of gas over the corresponding period of last year, being equal to something over 10 per cent. There had been a decrease in the following items of expenditure—namely, coals and cartage, £385 16s. 8d.; wages and expenditure, £277 13s. 2d.; lime, £74 12s. 9d.; service-pipes, &c., £540 8s. 2d.; castings, £9 1s. 9d.; stationery, £12 3s. 10d.; oils and paints, £35 8s. 11d.; renewals and repairs, £495 19s. 11d—making a total of £1831 5s. 2d. The number of new services laid down during the half year had been 150. There was also another gratifying fact, which was that they had no bad debts. The average illuminating power, he might say, had been 15·26, or 1·26 above the standard required by the Act of Parliament. He might also remark, in passing, that they were prosecuting their Bill before Parliament with all care. It was true that they had been threatened with opposition from two quarters, if not three. He thought, however, that it would be more prudent not to discuss the subject at that meeting, as it was yet *sub judice*, but to leave it in the hands of the Directors. He could, however, assure them that, whoever the new Directors might be, the retiring Directors would render the new Board all the service in their power in carrying the Bill.

Alderman DALE seconded the motion, which was agreed to.

Mr. J. L. HALL moved—"That a dividend of 4½ per cent. be paid on the A stock, and 3½ per cent. on the B stock and subscribed new capital of the Company, for the half year, payable by warrant on the Company's Bankers, on the 6th day of March."

The resolution was seconded by Mr. J. RIDLEY, and passed unanimously.

A vote of thanks to the Chairman and Directors for their services during the past year was then agreed to.

Dr. ARMSTRONG returned thanks on behalf of the Directors.

Mr. DUNCAN moved a vote of thanks to the Chairman for presiding, which was seconded by Mr. T. JACKSON, J.P., and carried.

The CHAIRMAN, in returning thanks, said he had always endeavoured to perform his duties to the utmost of his ability.

The retiring Directors and Auditor were re-elected, and the proceedings terminated.

BRIGHTON GASLIGHT AND COKE COMPANY.

The Ordinary General Meeting of this Company was held on Thursday, the 27th ult.—Mr. JOHN MILES in the chair.

The following report of the Directors, and the accounts for the half year ending Dec. 25, 1878, were submitted:—

The Directors have again the pleasure, in presenting their report, of announcing an increased demand for gas, notwithstanding that the Brighton season, owing to the general depression of trade, has not been a good one.

Progressive alterations in the manufacturing department continue to show a better result in the residuals.

It was thought desirable, from Michaelmas last, to reduce the price charged for gas in the Preston district to the uniform rate of 3s. 6d. per 1000 feet, and this alteration took effect from that date.

Preparation for considerable improvements on the works and readjustment of the mains, mainly affecting Preston, is now being made, involving a call on the 1874 issue of shares, of which due notice will be given.

The Directors have pleasure in recommending the declaration of a dividend for the half year ending the 25th of December last of 5 per cent. (less income-tax), the same to be payable on and after the 10th of March next.

Two of the Directors (Mr. Bunnell and Mr. Roe) and one of the Auditors (Mr. Forrest) retire by rotation, but are all eligible for immediate re-election.

Dr. *Profit and Loss Account, for the Half Year ending Dec. 25, 1878.* Cr.

Coals	£13,497	12	3	Gas and meter rental	£22,816	0	1
Law and incidental	100	0	0	Coke, &c.	4,323	2	2
Contingency-fund	200	0	0	Old stores, &c.	40	8	7
Materials for purification	372	0	0				
Wages	2,303	6	7				
Rent, rates, and taxes	354	10	5				
Salaries, Collectors commission, Directors, & Auditors	1,500	10	2				
General charges	132	17	7				
Wear and tear	3,087	4	2				
Bad and doubtful debts and allowances	200	0	0				
Balance	5,411	9	8				
	£27,179	10	10		£27,179	10	10

Balance-Sheet.

Capital	£107,800	0	0	Expended on works	£93,128	11	0
Contingency-fund	5,975	12	6	Works in progress	7,756	6	11
Depreciation account	1,977	3	11	Meters	2,257	16	9
Coal insurance account	2,000	7	1	Coal, coke, &c., in stock	3,218	17	4
Dividends unpaid	1,972	19	7	Mains, service-pipes, and general stores in stock	1,505	7	5
Tradesmen's accounts, &c., owing	2,020	4	0	Sundry debtors for gas	15,714	5	6
Temporary loan	2,029	13	1	Do. do. for coke, &c.	2,393	15	4
Profit and loss balance—				Cash at bankers and in hand	3,729	2	2
Balance from last half year £516 12 6							
This half year, as above 5,411 9 8							
	5,928	2	2				
	£129,704	2	5		£129,704	2	5

The report and accounts were approved, and the dividend recommended by the Directors was declared.

The retiring Directors and Auditor were re-elected, and it was resolved—"That the best thanks of the meeting be given to the Directors, for their attention to the affairs of the Company; to the Auditors, for their attention to the accounts of the Company; to Mr. Rutter, Mr. Liddall, and the other Officers of the Company; and to the Chairman, for his able and courteous conduct in the chair."

PONTYPRIDD WATER-WORKS COMPANY.—A meeting of this Company was held on Thursday, the 27th ult. Mr. D. Davies presided, and a dividend of 5 per cent. on the original shares was declared. The subject of the new reservoir at Ferndale was again discussed, and it was agreed, as soon as sufficient funds were in hand, to proceed with the work at once. The prospect of the project was considered very satisfactory. Mr. W. Griffiths and Mr. Hughes were elected Auditors.

WAKEFIELD GAS COMPANY.

The Sixty-fourth Half-Yearly Meeting of this Company was held on Monday, the 24th ult.—Mr. W. STATTER, J.P., in the chair.

The SECRETARY and MANAGER (Mr. J. W. Whitaker) read the notice convening the meeting, the following report being taken as read:—

The Directors have pleasure in placing before the Proprietors, the audited accounts of the Company for the half year ending Dec. 31, 1878.

The amount divisible amongst the Proprietors will be £5894 3s. 11d., out of which the Directors recommend the payment of dividend for the half year, at the rate of 10, 7½, and 7 per cent. per annum, respectively.

The fencing of the additional land has been completed, and the additions to the purifying plant are on the point of completion.

The works generally are in good order.

The dividend will be paid on the 1st day of March, clear of income-tax.

The Directors regret that Mr. John Whitaker, who has held the office of Secretary nearly 33 years, has found that, from increasing infirmities, he is unable any longer to perform his duties satisfactorily. He has, therefore, tendered his resignation, and the Directors have appointed his son, Mr. John William Whitaker, both Secretary and Manager, whose stipend will have to be settled by the general meeting.

Dr.—*Revenue Account, for the Half Year ended Dec. 31, 1878.*

To Manufacture of gas—			
Coals, including dues, carriage, unloading, and all expenses of depositing same on works	£2,800	11	11
Purifying materials, oil, water, and sundries at works	281	12	4
Salaries of Engineers, including Chief Engineer (if any), Superintendents, and Officers at works	87	10	0
Wages and gratuities at works	841	0	9
Repair and maintenance of works and plant (including renewal of retorts), machines, apparatus, tools, materials, and labour	709	12	10
Distribution of gas—			
Salaries of Surveyor, Chief Inspector, Inspectors, Assistant Inspectors, and Clerks in light office	127	13	6
Repair, maintenance, and renewal of mains and of service-pipes, including materials, laying and paving, and labour	215	3	2
Repairing, renewing, and refixing meters	157	5	0
Public lamps, lighting and repairing	42	3	7
Rates and taxes	293	12	10
Management—			
Directors allowance	200	0	0
Salaries of Secretary, Accountant, and Clerks, Office Keepers, and Messengers	154	2	0
Collectors salaries	117	10	0
Stationery and printing	41	17	2
General establishment charges and incidentals	26	9	1
Auditors	12	12	0
Law charges	0	16	0
Bad debts	59	0	0
Total expenditure	£6,181	12	2
Balance carried to profit and loss account	6,433	2	5
	£12,614	14	7

Cr.—*Revenue Account.*

By Sale of gas—			
Common gas	£8,273	15	8
Public lighting and under contracts	771	11	4
Rental of meters	350	1	4
Residual products—			
Coke, less labour and cartage	1,035	14	2
Tar, " "	1,058	17	2
Ammoniacal liquor "	1,015	15	5
Rents	48	13	0
Transfer fees	1	17	6
Fitting and service-laying account	58	6	3
Interest on delayed calls	0	2	9
	£12,614	14	7

The CHAIRMAN, in moving the adoption of the report and statement of the accounts which accompanied it, said he was pleased to be able to state that the works were in very good order, and that the Directors kept them in that state out of the current revenue. The quantity of gas made from each ton of coal which had been used at the works during the last half year was about 9000 feet, or about the same quantity as in the previous half year, and its average illuminating power was equal to 17 candles. The total quantity of gas made at the works last half year was 71,913,000 feet, as against 70,063,000 in the corresponding half of 1877. The leakage was 15½ per cent. last half year, as against 17¼ per cent. in the corresponding period of 1877. He might also mention that their revenue was about £1500 more than it was a year ago. They had altogether considerably more profit on the last than in the previous half year. This chiefly arose from a great increase in the value of the residual products, which were now paying the Company very well indeed. The increase of income on residual products alone was no less than £570, which he thought they would agree with him was very satisfactory indeed. That large increase was mainly owing to the erection of a new steam condenser, by means of which they were able to obtain a much larger quantity of ammoniacal liquor than previously, and the remainder of the enhanced profit was derived from the increased sale of gas. After allowing for the payment of the usual dividends of 10, 7½, and 7 per cent., as recommended, there was a balance of £2097 15s. 11d. to carry to the reserve-fund. Some persons might perhaps say that with such a handsome surplus in their hands the Directors ought to decrease the price of gas. The Directors had very carefully and thoughtfully considered that matter, and the unanimous decision they had come to was that they ought to add that amount to their reserve-fund, which at present only stood at £2000, and make it up to £4000, because they thought that £4000 was not too much for a company to have in reserve whose capital was £90,000. They had now an opportunity of adding the £2097 15s. 11d. to the reserve-fund, and the Directors thought it was their bounden duty to do so. They did not know what might happen in the future, although he might say that they had much less alarm now about the electric light than they had six months ago. The Directors thought it very desirable that all companies should have a good reserve-fund, and therefore they strongly advised the Shareholders to place the £2097 15s. 11d. to the reserve-fund, and thus bring it up to £4000, which was a very small reserve on a capital of £90,000. They had power, he believed, to make their reserve-fund equal to one-tenth of their paid-up capital, which would be £9000, but the addition they proposed to make only increased it to £4000. The capital account at the end of June last stood at £89,499 11s. 5d., and they had expended during the last half year £2154 on land, and £772 9s. 10d. on new buildings, plant, and machines. Of this £772, £380 was for building a fence wall round their works, £234 in providing a new shed, and £60 in additional retorts, making together £724 out of the £772. As to the revenue account they paid £2800 11s. 11d. last half year for coals and delivery, as against £2988 10s. 9d. in the corresponding half year; so that they had saved something in that item in consequence of a slight reduction in the price of coals. The total cost of the manufacture of gas at their works last half year was £4728 7s. 10d., against £4794 13s. 1d. There was not a very great amount of difference between those two amounts, but still they would see that there was a saving of about £60. The cost of the distribution of gas last half year was £500 1s. 8d., as against £365 17s. 3d., but the former item included the renewal of a great number of service-pipes out of

the revenue. The total income for the last half year was £12,614 14s. 7d., as against £11,062 9s. 2d., so that gave them a little over £1500 more to deal with than they had at the close of the corresponding half year of 1877. In conclusion, he said the Directors thought the statement of accounts a very satisfactory one, and they hoped the Shareholders thought so too.

Mr. G. H. Westerman, J.P., seconded the motion, and it was carried unanimously.

On the motion of the Chairman, seconded by Mr. W. Briggs, the dividends were ordered to be paid as recommended.

The Directors recommended that Mr. John Whitaker, the late Secretary to the Company, should be allowed a life pension of £200 per annum, and that his son, Mr. John William Whitaker, should be appointed as Secretary and Manager, at a salary of £250 per year, with house, coal, gas, and rates free.

These recommendations were heartily and unanimously confirmed, the Directors and several of the Shareholders speaking in very eulogistic terms of the faithful manner in which Mr. Whitaker, the retiring Secretary, had served the Company.

Mr. J. W. Whitaker thanked the Shareholders for the unanimous manner in which they had adopted the recommendations of the Directors, and assured them that there should be nothing wanting on his part to fulfil the duties to their satisfaction. He also returned thanks on behalf of his father for the liberal pension they had granted him, and said the handsome manner in which they had appreciated his father's services, and spoken of him that day, would be a source of great pleasure to every member of his family.

A hearty vote of thanks was accorded to the Chairman and Directors,

On the motion of Mr. Henry Robinson, seconded by Alderman Moorhouse, it was agreed that at the future half-yearly meetings a dinner should be provided for as many of the 328 Shareholders as signified their intention to attend it, each person to pay for his own dinner.

BROMLEY GAS CONSUMERS COMPANY.

The Annual Meeting of this Company was held on Thursday, Feb. 27—Mr. R. Latter in the chair.

The Directors report stated that there had been an increase during the past year of 7½ million cubic feet in the quantity of gas sold as compared with 1877; but the floods of last April occasioned loss and damage amounting to £500. This, with the low price of coke, and the increased capital expended upon new gasholder and retort-houses—unproductive last year—and the reduction in price of gas to 4s. per 1000 feet, brought down the actual profit to £5261 10s. 9d. This not being quite sufficient to pay the maximum dividend, the Directors recommended that a sum be drawn from the reserve-fund, and that a dividend of 10 per cent. be paid upon the old capital, and 7 per cent. upon the new. The retiring Directors were Messrs. Robinson Latter and James William Ilott, the retiring Auditor being Mr. Thomas Morley, and these gentlemen offered themselves for re-election.

The Chairman explained that the reduction in the price of gas last year entailed a loss of £761, and to this must be added the £500 worth of damage caused by the floods. This would have been sufficient to make up the sum requisite for full dividends, and to enable them to carry over a surplus to the reserve-fund. In 1877 authority was given to the Directors to raise £20,000 additional capital under the old Act, and they thereupon called in Mr. Brothers, an eminent Engineer, well qualified to advise as to their future requirements. Looking at the rapid increase in the demands made upon the Company in the past, and the certainty of an equally great increase in the future, he deemed it necessary for them to start without delay, and provide for the future requirements of the place. Mr. Ritchie was a Director at that time, and he objected to the proposed large expenditure—his general course of action at the Board being directed to restricting the expenditure to the lowest possible limits—and, as a consequence, there was a disagreement upon the subject, the result being that, in deference to his opinion, the Board consented to modify their original proposal, and reduce the size of their new receiving-tank. Every member of the Board now regretted most sincerely that they had not adhered to their original proposal, for the small additional cost would have greatly increased the storeage room of the Company, and have proved a great saving in the end. The rapid increase in the consumption of gas forced them to the expenditure of their total available capital, and they had throughout acted under the very best advice they could obtain, and given to the Shareholders the benefit of their many years experience in carrying on the management of the Company. The whole subject of this expenditure was laid before the Shareholders, and approved by them at the general meeting held in 1877. The Proprietors, by their votes on that occasion, decided that their interests were safe in the hands of the present Board, and he hoped that nothing since done by them had forfeited the confidence thus reposed in them. They had been told that the future of the Company was momentous, but he failed to see anything but a satisfactory future before them, and there was nothing to alarm them in the fact that they had come to the length of their tethers as regarded their borrowing powers; such a fact spoke well for the increased prosperity of their trade. They found themselves about to be called upon to still further increase their supply of gas, and they could not raise the capital necessary for the purpose without going to Parliament, and they, therefore, sought powers for such a sum as would prevent the necessity of going again for a considerable time, though the whole sum was not now required. They had acted under the best advice, and he would explain that any gas company now going to Parliament for additional capital would be compelled to offer their new shares by public auction. He moved that the report and balance-sheet be received and adopted.

Mr. J. W. Ilott seconded the motion. He compared the report and balance-sheet with those of the previous years as proof that the Directors had not been lacking in their duty to the Shareholders and the public, and also as proving the immensely increased business now done by the Company. It was absolutely necessary, he said, to enlarge the works, if they were to supply the neighbourhood; the increased consumption of gas being 5½ millions during 1878, and quite recently, in this cold weather, some of the weeks consumption had been 500,000 cubic feet in excess of last year.

Mr. Wylde supported the motion. He said, with regard to the new works, he was, in the first instance, somewhat frightened at the large amount proposed to be expended, and he supported Mr. Ritchie's proposition to reduce the size of the new gasholder; but, from the experience of the past year, he felt convinced that they were quite wrong, and he was very sorry that their view was adopted. He knew Bromley well, and did not think that new building had gone on so rapidly of late as it had in former years; therefore, he did not anticipate anything like the rapid increase in the consumption of gas which had taken place—indeed, the increase last year quite surprised him, for he never thought it possible. But for the new holder the town would have been in darkness upon several occasions, and they only managed to keep up the supply by having the retorts in first-rate order, and sparing no expense to produce the maximum amount of gas within a limited time. This alone pulled them through. If the present rate of increase was maintained, and their new works were not finished before next winter, they would find themselves in darkness. With regard to the dividend and the earnings of the past year, they could not expend large sums of money and make them bring in a return immediately, before the new works were complete; and, even if they had to put up with a slightly diminished interest for a year or two, until the additional outlay became remunerative, though such a contingency was not probable, the back dividends would be made up hereafter—they would not be lost entirely.

Mr. Acton supported the adoption of the report, and said they had been told by Mr. Ritchie that they were not bound to supply gas; but he realized during the recent floods the very serious responsibilities cast upon them. When the floods put out the fires, he and the Manager communicated with the railway companies to supply lights for signalling, and he felt that if an accident had occurred through the cutting off of gas, they might have been responsible for a sacrifice of life and property. He never experienced such an anxious time before, and only wished Mr. Ritchie had been in his position. He most sincerely regretted ever having consented to a reduction in the original plan for the new gasholder. They had done a very wrong thing, and those who came hereafter would call them insane for putting up a small concern upon land which would have accommodated a much larger holder, and so wasted valuable space which was now useless.

Mr. Ritchie opposed the adoption of the report and accounts, upon the grounds of their incompleteness and insufficiency of details, and the absence of information to explain the small earnings of the Company in 1878. He compared the earnings of the Company since 1875, taking into account the gradual increase of capital employed, and contended that the growth of expenditure had been wholly disproportionate to the profits. The reduction in the price of gas was unwarrantable, he said, and the Directors ought not to have been liberal to the Public, and curried favour with them, at the expense of the Shareholders. They were entitled to the dividend allowed by the Legislature, and it was bad management on the part of those who directed the concern if the full amount was not paid. There were no details of the £500 loss set out in the balance-sheet, and there was £986 set down as increased cost of coal for the year; whereas the gas-rental had only increased £773. How was this? According to his experience, every pound spent in coal produced two pounds in gas; and in the case of the Sevenoaks Company they spent £1842 in coal last year, and received £4514 for gas, their price being 5s. per 1000 feet. Reducing this to 4s. per 1000 feet, there was still £3753, which was the natural and proper return, whereas the Bromley Company had only 31s. for every £1 worth of coal. What was the explanation? He objected to the increase of Directors fees for the past year, and instead of drawing upon the reserve-fund to make up the dividend, he suggested that the Directors, on their side, should give up £200 of their pay, and that the Shareholders should forego the small remaining balance of dividend.

The Chairman replied to the various points raised by the last speaker, and remarked that whether the Company earned 20 per cent. in one year and 10 per cent. in another was of small importance to the Shareholders, as they were always paid their maximum dividend, and after that the public received the benefit of any reduction which could be made in the price of gas. Having explained in detail the items making up the £500 damage done by the floods, he went on to quote those figures in the balance-sheet which answered the other points raised as to the earnings of the past year, alluding also to the reduced price of coke by reason of the Crystal Palace Gas Company sending their produce into Bromley by means of the new railway. The Directors had deemed it right to place their new works in the hands of good men, upon whom they could rely, and after the experience of the past he would rather pay Messrs. Aird and Son a little more than any one else, because they would spare neither pains nor expense to carry out their undertakings with credit to themselves and satisfaction to those who employed them. In the exercise of the discretion vested in the Directors, they had done their very best in the interests of the Company, and he believed that they had been successful. After 20 years experience as their Chairman, he did not hesitate to express his firm conviction that, with the extra capital asked for, there was not the slightest reason to doubt their ability to pay all the Shareholders their full dividends in the future as they had in the past.

Mr. Muffett asked whether there was power to take money from the reserve-fund for the purpose of making up the dividend.

The Chairman read the clause giving such power, and

After a few further remarks, the report and balance-sheet were adopted, only Mr. Ritchie and Mr. Muffett dissenting.

A dividend of 10 per cent. was then declared, and the retiring Directors and Auditor were unanimously re-elected. It was also resolved to hold half-yearly general meetings, to pay dividends, and also to have the balance-sheets made up half yearly in the future.

The Chairman then proposed that the Company's Bill now before Parliament be approved, and he asked Mr. Blythe, the Agent, to give an outline of the various clauses.

This was done, and the only point which gave rise to remark was that relating to the new capital ranking equal with the old stock in respect to payment of dividends. It was further explained that a standard price of 5s. 2d. per 1000 feet had been put in the Bill, but this might be modified in Committee.

The Chairman said they were no doubt aware of the threatened opposition to their Bill because of the clause relating to electric lighting; but so confident did he feel that the electric light was not likely to be brought into use there, that he did not care one jot whether the clause remained in the Bill or not. The other Directors thought differently, and they outvoted him upon the subject.

Mr. Wilde seconded the motion, which was opposed by Mr. Ritchie at considerable length; but in the result the resolution was carried, with four dissentients.

CANTERBURY GAS AND WATER COMPANY.

The Half-Yearly Meeting of this Company was held on Friday, Feb. 28—Mr. G. Finley presiding—when the following report of the Directors was taken as read:—

During the last half year the consumption of gas has greatly increased, and the judicious additions which have been made to the gas-works during the last three years have enabled the Company to meet the demand promptly and economically. In April, 1877, the price of gas was lowered from 4s. per 1000 feet to 3s. 9d., and your Directors now feel justified in allowing a further reduction of 2d., thus making the price of gas from the 1st of January last, 3s. 7d. per 1000 cubic feet. By these reductions the gas consumers have been relieved to the extent of £1370 per annum.

Your Directors feel that the time has arrived when some further remuneration should be awarded for their past and present services. While the Company were struggling to obtain the full benefit of the large outlay of their subscribed capital, your Directors worked strenuously, at a very inadequate remuneration, to attain this end. The business is now in good working order; the Shareholders are receiving the maximum dividend allowed by their Act; the £75,600 capital of the Company, under a moderate computation, has increased in value 50 per cent.; and the public are being supplied with both gas and water at a cost which will favourably compare with any inland town of the same population. Under these circumstances, your Directors feel that the addition of £130 to their remuneration (raising the amount to £380 amongst the twelve Directors) is such as the Shareholders will not object to. Your Directors prefer introducing this question into their report, for the information of the whole of the Shareholders, rather than bring it before the half-yearly meeting, when only a small number may be present.

The building which was converted into a house for the Engineer at the water-works has been found totally unsuitable as a residence; it has, therefore, been deemed necessary to give instructions for plans to be prepared for a suitable house, and a contract has been entered into for its erection.

The balance standing to the credit of profit and loss account is £4252 2s. 7d., and your Directors are much gratified in being able to point to this prosperous state of affairs, and in recommending that a dividend for the half year, after the rate of 8 per cent. per annum, free from income-tax, be declared and paid on and after Monday, the 3rd of March next.

Messrs. George Furley, Frederick Flint, George Beer, and James William Pilcher are the retiring Directors for this year, and they, having given the notice required by the bye-laws, and being duly qualified, seek for re-election.

The CHAIRMAN, in moving the adoption of the report, referred to the electric light, and briefly alluded to the reduction of 2d. per 1000 feet in the charge for gas from the 1st of January, as recommended in the report. He then at some length stated the grounds upon which the Directors asked for an increase of £130 in their fees. At the formation of the present Company, in 1867, the Directors were voted the annual sum of £120, but the duties of the present Directors had greatly increased, for, instead of twelve meetings in a year, the meetings had increased to 64. In 1874 the amount voted to the Directors was £250 instead of £120. The Shareholders now received their parliamentary dividend, 8 per cent., and the works were thoroughly established, so the Directors felt themselves justified in asking for an increase. The time had arrived, he thought, when the Directors should have their remuneration finally established, which would be that the Chairman should receive £50 per annum, and the Directors £30 each.

Alderman MARTEN moved the adoption of the report, which was seconded by Mr. FLINT.

Mr. DANCE protested against the addition to the Directors fees, and asked if it were the unanimous recommendation of the Directors.

The CHAIRMAN: I could answer that question very easily, but I do not think I am at liberty to do so.

Mr. DANCE hoped that if any Director received the advance under protest, that Director would hand the money over to the hospital. If a reduction were required, he should expect that Mr. Rayner would move that at least one-half of the Directors should retire, including himself.

Ultimately the report was adopted unanimously.

A dividend of 8 per cent. was then declared, and some business of a formal character having been transacted, the meeting terminated.

CHATHAM AND ROCHESTER WATER-WORKS COMPANY.

The Half-Yearly Meeting of this Company was held on Tuesday, the 18th ult.—Mr. J. BAIRD in the chair.

The half-yearly report expressed the gratification of the Directors at the satisfactory progress of the Company. The Directors recommended a dividend at the rate of 7 per cent. per annum, free of income-tax. The statement of accounts showed that the revenue during the past half year had been £5706, leaving, after the payment of all charges placed to revenue account, a balance profit of £1674 available as dividend. The reserve-fund for contingencies now amounts to £7021.

The CHAIRMAN, in moving the adoption of the report, observed that they had increased their revenue account by £1000, and had placed a further sum of £700 to the reserve-fund. The Directors had decided, whilst iron pipes were so cheap, to substitute 6-inch mains for the 3-inch pipes from St. Margaret Street to Borstal, and the cost had been paid entirely out of the revenue account. One of the engines at the works had broken down, and the cost of repairing the accident had been upwards of £200, which would account for the heavy items on the balance-sheet; but there was nothing further in the accounts which required explanation from him.

The resolution, having been seconded, was unanimously adopted.

Resolutions were adopted declaring a dividend at the rate of 7 per cent. per annum; and re-electing the three retiring Directors, Messrs. J. Baird, C. Withecomb, and H. Watts; and one of the Auditors, Mr. W. Syms.

The meeting was then made special for the purpose of authorizing the Directors to increase the capital of the Company by the issue of 1000 additional shares, at a premium of £2 each.

The report of the Directors stated that, under the Company's Act, the Directors were authorized to raise additional capital as might be required from time to time. The consumption of water throughout the district had increased so enormously that the Directors were compelled to make very considerable additions to the works, and they had accordingly entered into a contract to supply and fix a new and powerful engine, fitted with all the latest improvements. The Directors also contemplated carrying out other works to improve the supply of water to the districts served by the Company. They therefore recommend that the additional sum of £5000 should be raised by the issue of 1000 new shares, at a premium of £2, the sum of £2000 being carried to the reserve-fund.

The CHAIRMAN moved the adoption of the report. He said the Directors proposed to lay down an additional main throughout the district served, and so avoid the inconvenience to which they were now occasionally put through the bursting of pipes. It had been asked, where would the sum come from to pay the dividend if they raised increased capital. To that he would reply that they had placed £700 to the reserve-fund, and that was sufficient to pay a dividend on £10,000, while upon £5000 they would require £350 only. No further addition would be made to the reserve-fund, which would increase itself.

After some remarks from Mr. GARDNER, the report was unanimously adopted.

Mr. R. PRALL, in moving a vote of thanks to the Chairman and Directors, spoke in high terms of commendation of the manner in which the Directors had conducted the business of the Company.

Mr. BOLTON seconded the motion, which was unanimously adopted.

A vote of thanks was also given to the Secretary and other Officers of the Company, and the proceedings terminated.

COLNE VALLEY WATER COMPANY.

The Tenth Ordinary General Meeting of this Company was held at the Charing Cross Hotel, on Friday, the 28th ult.—Viscount MALDEN in the chair.

The SECRETARY (Mr. Philip Verini) read the advertisement convening the meeting, and the following report and accounts were presented:—

The Directors beg to lay before the Shareholders the balance-sheet and revenue account of the Company for the past half year; also a statement, showing the revenue account for the whole year, as compared with 1877.

It will be observed that the income of the Company for the past year has increased by £1280 9s. 5d., but the additional debenture loan interest and working expenses still cause the expenditure to exceed the income, the excess for the year amounting to £301 1s. 7d.

Some of the extensions have only recently been completed, and have not yet contributed to income.

John Robert Hollond, Esq., Charles Edward Keyser, Esq., and William Arthur Tooke, Esq., retire from the Directorate, but offer themselves for re-election.

The Directors have pleasure in announcing that James Bury Capel, Esq., has also consented to join the Board, and his name will be proposed to the meeting for election as a Director.

Thomas Francis Blackwell, Esq., retires from the Auditorship, but offers himself for re-election.

DR.—*Balance-Sheet, Dec. 31, 1878.*

To Capital—			
10,000 shares, at £10 per share, paid up			£100,000 0 0
Debentures			21,500 0 0
Loan on debentures			3,000 0 0
Sundry creditors—			
Capital account	£1,824 4 9		
Revenue	1,000 0 7		
		2,824 5 4	
			£127,324 5 4

CR.—*Balance-Sheet.*

By Expenditure, as per last account, to June 30, 1878, for works construction, purchase of land, parliamentary and incidental expenses; also expenditure for pumping-engines, plant and machinery, and cottage	£118,951 11 10		
Expenditure since June 30, 1878, for finishing the Pinner district, &c.	2,189 5 1		
		£121,140 16 11	
Office furniture and fittings		117 17 5	
Plumbing plant and tools		93 5 6	
Meters		671 9 2	
Stores on hand—			
Pipes, valves, hydrants, &c.	£1,251 7 2		
House stores	374 19 0		
		1,626 6 2	
Debtors—			
For water-rates	975 9 3		
For fittings and connections	299 6 7		
For Sundries	211 7 10		
		1,486 3 8	
Cash—			
At Bankers	1,003 0 1		
Petty cash	38 12 4		
		1,041 12 5	
Revenue account—balance		1,146 14 1	
		£127,324 5 4	

DR.—*Revenue Account, for the Half Year ending Dec. 31, 1878.*

To Balance from last account			£769 9 0
Office expenses, rent, printing, stationery, &c.			90 9 0
Legal expenses—			
For the year ending June 30, 1878	£31 11 9		
For the half year ending Dec. 31, 1878	12 6 6		
		43 18 3	
Wages		216 7 10	
Salaries		176 13 0	
Insurance of works, boilers, &c., for twelve months		31 0 0	
Commission to Collector		27 4 0	
Rates and taxes		26 15 0	
Advertising and incidental expenses		9 12 3	
Stable expenses		14 6 0	
Engine working expenses	£111 18 8		
Less stores on hand	10 12 5		
		101 6 3	
Lime		39 19 0	
General working expenses		45 16 5	
Labour and material repairing pipes		51 12 2	
Meter repairs		1 9 2	
Interest on debentures and loan		610 11 7	
		£2,256 8 11	
Balance		£857 19 5	
Interest on loans, as per last revenue account		31 12 7	
Do. on calls paid in advance, as per last revenue account		230 14 7	
Stamps on debenture bonds, as per last revenue account		25 7 6	
Do. do. during last half year		1 0 0	
		£1,146 14 1	

CR.—*Revenue Account.*

By Water-rates	£1,217 18 0		
Do. for building supplies	27 8 3		
Do. in advance	0 6 9		
Special rates	1 10 0		
		£1,247 3 0	
Meter-rents		37 15 0	
Sale of gravel		62 17 3	
Do. of refuse lime		5 15 0	
Transfer fees		0 15 0	
Plumbing account		44 4 3	
Balance		857 19 5	
		£2,256 8 11	

DR.—*Statement showing the Revenue Account, for the Year 1878, as compared with that of 1877.*

	Dec. 31, 1877.		Dec. 31, 1878.
To Office expenses, rent, printing, stationery, &c.	£152 2 2	..	£169 0 1
Legal expenses	33 12 6	..	43 18 3
Wages	309 2 10	..	428 4 10
Salaries	230 0 6	..	*444 9 0
Insurance of works, boilers, &c.	31 2 3	..	31 0 0
Commission to Collector	20 4 6	..	44 14 0
Rates and taxes	7 16 6	..	35 14 9
Advertising and incidental expenses	—	..	27 12 3
Stable expenses	53 5 3	..	28 5 11
Engine working expenses	139 19 2	..	219 17 1
Lime	34 13 4	..	71 10 8
General working expenses	72 18 8	..	107 17 4
Compensation for damage done to van	4 5 0	..	—
Medical attendance to labourer injured	3 0 0	..	—
Labour and material repairing pipes	164 1 5	..	102 0 10
Meter repairs	1 11 3	..	2 13 8
Auditor	5 5 0	..	—
Interest on prepaid calls	0 2 8	..	0 12 5
Do. on debentures and loan	524 0 7	..	1101 11 2
	£1,817 3 7	..	£2,859 11 3

CR.—*Statement showing the Revenue Account.*

	Dec. 31, 1877.		Dec. 31, 1878.
By Water-rates and meter-rents	£1,033 11 4	..	£2,304 7 10
Sale of gravel and refuse lime	6 6 6	..	106 4 3
Transfer fees	2 11 6	..	1 10 0
Plumbing account	184 6 0	..	126 12 0
Interest on deposits	51 4 11	..	19 15 7
Balance	539 3 4	..	301 1 7
	£1,817 3 7	..	£2,859 11 3

* £100 of this was properly chargeable to the year 1877, but not having been voted until the general meeting in 1878 could not have been paid previously.

The CHAIRMAN: Gentlemen, I have very few remarks to make, with regard to the Company, in addition to what were made last time, beyond the fact that all the principal works may now be considered as finished. Of course, I do not include the extensions which may now and then take place. Those, I trust, will always go on for some time to come. The

more we extend, the more work we shall get, and the more revenue we shall receive. The Directors have very strong regrets that they have not been able to pay a dividend this year, nor do I see any prospect of paying a good one just at present. We all know that water companies take a very long time to develop; and, latterly, although our business has increased considerably, still I must say that for the last few months we have not had so many applications for water as might have been desired, and certainly not so many as we expected. I believe that the general depression of trade has a great deal to do with that. There is nothing doing, and people are reluctant to spend money even upon necessaries, and certainly water is a necessity, which people in our district will find they must eventually obtain. We had hoped that the balance of £1057 against the Company, which was shown in the account issued in August, 1878, would have been reduced during the past half year; but, as you will see, there is an addition of £89 10s. 5d. As far as working is concerned, during the last twelve months we have pumped up and supplied, on an average, 130,219 gallons of water per day, the revenue from which has been £2304 7s. 10d.; but with the present engines, if we lowered the pumps, which we could do at a comparatively small cost, we should be able to supply about eight times as much water as we now do. At the present time our works are more than sufficient to supply every possible demand that we can have made upon us. There are a large number of houses in the district which are not supplied with water, and which have not yet applied for it; but we hope that in time, when the occupants see the benefit to be derived from a supply, they will ask to have it laid on. The Metropolitan Railway Extension to Harrow is being pushed forward very rapidly, and when that is open there will, no doubt, be a great many houses built in the vicinity of Harrow, Sudbury, Wembley, Kingsbury, and all that district, which must eventually conduce to the benefit and profit of the Company. The Metropolitan Board of Works have withdrawn their Bill to acquire power over the London Water Companies; so that at present there is no fear of our being bought up. As far as water-rates are concerned, we are showing not only a steady, but a very rapid increase. In December, 1877, as you will see by the accounts, the water-rates and meter-rents amounted to £1033 11s. 4d. On Dec. 31, 1878, they amounted to £2304 7s. 10d., and now they have risen to £2780 2s. 4d., which is an increase of £400 within the last two months. I think the Directors may consider that a most satisfactory increase, and we trust that if we can go on improving at that rate, we shall soon be able to declare a good dividend. I beg to move that the report and accounts be received and adopted.

The DEPUTY-CHAIRMAN (Sir E. W. F. Walker, K.C.B.) seconded the motion, and it was carried unanimously.

The retiring Directors were then severally re-elected.

The CHAIRMAN said he was happy to say that the Directors had made a very strong addition to their Board, which he thought would be satisfactory to the Shareholders. He would ask them to assent to the proposition that James Bury Capel, Esq., join the Board of Directors. Mr. Capel was a gentleman of great commercial power and influence, and a very large Shareholder in the Company.

Mr. HUDSON seconded the motion, and it was carried unanimously.

On the motion of Mr. Moss, seconded by Mr. SCOTT, Mr. T. F. Blackwell, the retiring Auditor, was unanimously re-elected.

At the suggestion of the Chairman, Mr. ROWBOTHAM, in the absence of Mr. Bateman, the Engineer, rose to offer some explanatory remarks with regard to the position of the Company. He said: I am very sorry, my lord, that I have again to appear in the stead of Mr. Bateman. I can only say that the Company's works are in a very good state of repair. Thanks to Mr. Blackburn, the Engineer in charge, everything is being maintained in good condition. Speaking for Mr. Bateman, I must say the Company's progress during the past year, as revealed by the accounts, is exceedingly gratifying, because I find that the increase in 1878 over 1877 is just 100 per cent. That increase has been earned by an additional expenditure of only £365, due mainly to the increased consumption of fuel for the engines, and the extra labour of attending to the pipes in the large district over which the Company's water is now supplied. I believe that in the future the increase in the working expenses will not exceed, in proportion, that which has obtained during the present year. Under all the circumstances, therefore, I think it is a matter for congratulation to the Shareholders that the Company are progressing so steadily and satisfactorily. One matter has been referred to—not, perhaps, at this meeting, but outside—and that is the question of bursts during the recent excessively bad weather. His lordship has stated that up to the end of the year repairs necessitated by the frost had cost £33. Probably that will have to be added to, in consequence of the frost having continued during the last six or eight weeks; but I think, gentlemen, that if you only lived in the districts around London, which are supplied by the London Water Companies, and experienced the discomforts we have suffered during the late frost, you would find that the incovenience you may have been put to in the Bushey district has been very much minimized. With you, a burst pipe has been the exception; with us, it has, unfortunately, been the rule; and, therefore, I think the system of constant supply which prevails in this Company's district, has conduced very materially to save you from the discomforts and the losses and damages which we unfortunate Londoners, who are supplied under the intermittent system, have to suffer year after year. I think it is a matter for congratulation to the Colne Valley Water Company, and the persons who are supplied by them, that they have such a good system of supply, and one which reduces, to the extent it does, the risk of damage to their houses.

At the request of the Chairman, the SECRETARY read an extract from the *Lancet* of Feb. 15, in which was quoted Dr. Frankland's report for January, as to the freedom from organic impurity of the Colne Valley Company's water, as well as its softness, as compared with the water supplied by the Metropolitan Companies.

The meeting was then made special, "for the purpose (if thought expedient) of passing a resolution empowering the Company to increase its capital, by a sum not exceeding £10,000, by the issue of new shares of £10 each, such shares to be issued at such times, and subject to such conditions and regulations, as the Board of Directors shall see fit."

The CHAIRMAN said: I dare say a great many of the Shareholders are not very clear as to the intention of the Board in asking to be allowed to raise this extra capital by shares. The fact is that the Directors have had several applications from inhabitants in the district which the Company supply, to lay water on to their houses. Unfortunately, our capital being all expended, we have not the means of making any outlay whatever; and unless we can increase our area, and supply water to every one in the district, there is little chance of our paying a good dividend. The scheme proposed is that any householder requiring water laid on to his premises from the Company's mains, shall make application, and the Company will then ascertain the approximate cost of the work. Assuming that it comes to £100, the applicant is then to take up ten shares, which will yield £100, and that money is to be expended in the extension of the pipes to his house. These shares are to rank with the ordinary shares of the Company, and dividends will be paid upon them when the other shares receive theirs. The applicant, as well as paying in this way for his supply-pipes, will eventually benefit, by getting the work done, and receiving a dividend upon the amount laid out, and by being able ultimately to dispose of his shares. He will also benefit the Company, because he will pay them a water-rate just as if they had laid the water on without his contributing. That is the only way in which we can extend our business as we should wish to see it extended all through our district. I do not think that there can be any objection to the proposed arrangement, as it is simply making those who want the water pay for laying it on, instead of the Company doing so. You may be quite sure that the Directors will not lay out the money they receive on these shares otherwise than in making extensions which they consider necessary, and likely to prove advantageous to the Company. The resolution which I have to propose is—"That the capital of the Company be increased by such sum or sums, not exceeding in the whole the sum of £10,000, as the Directors shall from time to time determine, such additional capital being raised by the issue of new ordinary shares of £10 each, to be issued at such times, to such persons, and subject to such conditions and stipulations as the Directors see fit." As I have already said, if this £10,000 is wanted, it will not be issued all at once, but only to those applicants who require water to be laid on to their property at some distance from the Company's mains. The dividend these shares will bear will be limited to 7 per cent.

A SHAREHOLDER: The shares will not be issued to the general Shareholders?

The CHAIRMAN: No; only to those who require water. If you wished to have water laid on to your house from the present mains, you would have to take shares to the amount of the estimated outlay required for laying down the pipes, and also to pay for the water at the ordinary rate.

Mr. HALES asked whether a Shareholder who laid on water to his house would be able, if he wished, to take more shares than would pay for the work.

The CHAIRMAN said that what the Company proposed was to require the person who wanted to be supplied with water beyond a certain distance from the mains, to take shares sufficient to cover the cost of the work. The Company would benefit by that, because the other houses and cottages which stood on the side of the road along which new pipes were laid would be able to obtain a supply. This could be done anywhere within the Company's limits, though not beyond.

Mr. HALES asked what was the greatest limit from the works at which the Company could supply.

Mr. ROWBOTHAM said by the Water-Works Clauses Act, the Company were bound to supply any house within 300 yards; but they were not bound to supply any house beyond that distance, unless the person requiring such supply would guarantee to pay, for a certain number of years, a rate of 10 per cent on the outlay.

A SHAREHOLDER said he understood that no dividend was to be paid on these new shares, except when a dividend was paid on the original shares.

The CHAIRMAN said the new shares would rank the same as the others.

Mr. BIGGS asked whether any more debentures were to be issued at the same time as the new shares.

The CHAIRMAN: No; the resolution goes no farther than the actual issue of this £10,000 worth of shares for the purpose of extending the operations of the Company.

Mr. HALES said that the capital of the Company was about £100,000, and under some calculation which the Engineer made, they were warranted in asking for only £100,000. That sum had been subscribed, and the Company had gone beyond that, and asked for debentures to the amount of £25,000. He wished to know upon what principle the Engineer had based his calculation, in order that he might know the probability of his receiving a dividend, for he was afraid that the Engineer had gone beyond his calculations. If the Engineer had made his calculations correctly, the Shareholders ought almost to have had a dividend by then, for the pipes had been laid a sufficient time to supply the water and produce an income. A dividend of 5 per cent. upon the capital of £100,000 would require £5000. The £25,000 worth of debentures would require £1250. Those two sums together would be £6250 a year. At present, the Company's income fell exceedingly short of that amount. He wished to know whether, with the capital they had expended, they had laid down sufficient pipes to secure a revenue which would pay a dividend, and at what time that dividend would be paid.

Mr. ROWBOTHAM, at the Chairman's request, rose to reply to Mr. Hales. He said he could not state off-hand the basis upon which the original calculations were made, but, as far as he remembered, the districts to to be supplied were restricted at the outset of the Company's operations. He did not think they went beyond Stanmore, Bushey, Harrow Weald, Elstree, and Aldenham. The other districts to which they had extended were Edgware, Hendon, Mill Hill, Kingsbury, and Pinner. It was to meet the outlay in extending the pipes into these districts that the additional capital, represented chiefly by the debentures, had been required. They might take it generally that the original estimate of capital required was sufficient to give a supply to the districts included within the limits of the Company, except Edgware, Pinner, Hendon, Mill Hill, and Kingsbury. They were advised by their solicitors that it was necessary to lay down pipes into each district within the period prescribed by the Act of Parliament, and for that purpose it was necessary to increase the capital within that period, otherwise it might have been more to the convenience of the Directors and the Shareholders not to extend the mains where they now were extended. He might state that the pipes were laid throughout the whole district, and that if the inhabitants would take the water, as they were able to do, the revenue from the houses would enable them to pay a dividend. The new extensions cost about £20,000, and the capital outlay had been about £120,000; so that, assuming that he was correct in the statement that £100,000 was the capital which was required to give the supply within the district which was originally contemplated, then the estimates and the calculations of the Engineer had not been exceeded. The difficulty was caused by the inhabitants not coming forward to take the water as quickly as it was hoped they would do.

Mr. HALES: What proportion have done so?

The SECRETARY said only about one-third. He thought this was a very important matter. The new extensions which Mr. Rowbotham had spoken of, which had cost £20,000, ought to yield £1000 a year to pay 5 per cent. Already the extensions to the new places, which had only recently been opened, yielded a revenue of £1185.

Mr. ROWBOTHAM said that the revenue of £2300 a year was obtained from one-third of the houses in the district, and therefore it followed that if the other two-thirds would take water there would be a revenue of £4600 in addition to what they had at the present time, which would be 4·6 per cent. upon the capital; and this would be the result without taking into account the increase of buildings in the district.

The CHAIRMAN said he might state that the Directors were not in the least astonished at having to apply to raise additional sums, because they always contemplated it would be necessary, as the works were extended, to exercise the powers that were given them in their Act to issue debentures or to raise a further sum of money by the issue of fresh shares.

Mr. HALES thought the original capital ought to be primarily paid for.

He did not want any deferring in consequence of further capital being required.

Mr. Biggs thought the inhabitants of Bushey were waiting for a settlement of the sewerage question, before they took the Company's water.

Mr. S. Noakes said that a sewerage scheme, approved by the Local Sanitary Authority, was then before the Metropolitan Board.

Mr. Biggs said he should like to ask what the Directors thought about supplying Harrow and Sudbury with water. There was a good deal of fault found with the Harrow water.

The Chairman said the Directors had been in private communication with the present Harrow Board, but had not come to any understanding on the matter. They could not force Harrow to take their water.

A Shareholder inquired whether the money raised on the debentures was expended in districts not stated in the original prospectus of the Company.

The Chairman said it could not be expended in any way out of the Company's districts.

The Shareholder said in that case he thought the Engineer had made an error in his estimate, and he ought to have been more correct than to be £25,000 out.

Mr. Rowbotham explained that the progress of the Company was to be tentative, and they were in the first instance to take Bushey, Bushey Heath, Stanmore, and the district immediately around; but in the Act of Parliament it was always intended to include those other districts. They were not included in the £100,000.

The Chairman: £100,000 is not nearly sufficient to supply the whole district over which we have powers to send water.

The motion was then seconded by Mr. Edwin Taylor, and carried unanimously.

The Chairman intimated that the statutory number of Shareholders were present, either personally or by proxy.

On the motion of Mr. Scott, seconded by Mr. S. Humfress, a vote of thanks was accorded to the Chairman and Directors for their unceasing efforts on behalf of the Company.

The Chairman acknowledged the vote, and the proceedings terminated.

DERBY WATER-WORKS COMPANY.

The Half-Yearly Meeting of this Company was held on Thursday, the 27th ult.—Mr. G. Gascoyne in the chair.

The following was the Directors report:—

The Directors beg to submit to the Shareholders the accompanying statement of accounts for the half year ending Dec. 31, 1878.

The sum of £3975 7s. 11d. has been expended on capital account during the half year. The gross receipts from revenue amount to £7296 10s., compared with £6906 0s. 8d. in the previous half year, or with £6786 5s. 3d. in the corresponding one. The revenue expenditure is £4138 1s. 10d., compared with £4009 2s. 9d. in the previous half year. The realized profit available for the dividend is £3158 8s. 2d., which, with the aid of £366 11s. 10d. taken from the reserve-fund, will enable the Directors to recommend the appropriation of £3525 to the payment of a uniform dividend of 6 per cent., and will still leave £484 17s. 4d. as a reserve-fund.

The Engineers are well satisfied with the general state of the works, engines, and machinery, which are now in good working order, and excellent condition.

It is, perhaps, unnecessary to say that this is the position of the Company, despite the temporary depression which now affects it, in common with all other interests in the kingdom, and that a return to the ordinary commercial prosperity of a few years ago, would speedily increase the revenue arising from those sources derived from trade, and satisfy the reasonable expectations of the Shareholders.

The Chairman moved—"That the report of the Directors, and the balance-sheet of the Company's accounts for the half year ending the 31st of December last, be received, approved, and adopted." He said this was the twentieth occasion he had had to submit that resolution, but his remarks would necessarily be brief, or he might embarrass the proceedings now afloat. The Company were, of course, passing through a very serious crisis, but the commercial depression was participated in by the rest of the community. He stated in August, 1877, that a period of probably five half years, at least, would be required to set the Company straight, and enable them to recover their position. Only three half years had expired, and he must ask them to await patiently the result, and see whether his prophecy was not fulfilled. Since their Act of 1868, the capital of the Company had been increased to above £125,000, and they had been waiting for the recovery of the necessary revenue, for which no adequate time had yet been afforded. The gross receipts for the last half year were £451 more than the average of the two previous half years, and they bade fair to continue gradually to increase in a way that would shortly be very satisfactory. The gross receipts for the half year had been £7297. When the Act passed in June, 1868, the revenue for the year was only £7200, so that they had exactly doubled the income in ten years. He spoke thus hopefully to show that the prospects of the Company were not yet exhausted, and those who had thought so were grievously mistaken. He next alluded to the increase of expenditure, which was £129 over last half year, and said, although they had reduced the dividends to 6 per cent., they had only taken £366 from the reserve-fund, and there still remained in the fund £485. Their source of prosperity was still in the ascendant, 1240 houses, &c., having been added to the list of consumers during the year, 673 being in the last half year. He then referred to the admirable works of the Company. He would not say they had excited the cupidity, but they had excited the desire of the Corporation to possess them; but that was a question which would come forward a fortnight hence, and he would not say anything to embarrass free action. It should be remembered, however, that the Company had waited and had to wait for voluntary customers, whereas the Corporation could compel people to have the water, and thus extract their prosperity. He did not say they would do that; but they could do it, and that was a reason why the Company should not look for little, but much from them. In the hands of the Company the works had been made most efficient for all purposes, and if they had exercised their full power, they could have increased the price of water, on an average, 40 per cent. to all persons. But they had forborne to do that, but were waiting until the revenue developed and remunerated them for the enormous sum they had expended in such a manner as reason and justice entitled them to be remunerated.

Mr. Hefford seconded the resolution, which was carried unanimously.

The Chairman then moved—"That the dividend should be 15s. per share on the original shares, being at the rate of 6 per cent. per annum; 7s. 6d. per share on the £12 10s. shares of 1868, being at the rate of 6 per cent. per annum; 7s. 6d. per share on the new ordinary £25 shares of 1875, being at the rate of 6 per cent. on £12 10s. paid up; 3s. 9d. per share on the new ordinary £12 10s. shares of 1875, being at the rate of 6 per cent. per annum on £6 5s. paid up, such dividend to be payable on the 1st day of March next."

Mr. Richardson seconded the motion, and it was agreed to.

Lord Scarsdale and Mr. Huish were re-elected Directors, and Mr. Moody, solicitor, was elected an Auditor.

Mr. Baker moved a cordial vote of thanks to the Chairman, which was seconded by Mr. Jefferson, and acknowledged by the Chairman in a speech in which he bore testimony to the zealous care bestowed by the other members of the Board of Directors.

MAIDSTONE WATER-WORKS COMPANY.

The Annual Meeting of this Company was held on Thursday, Feb. 27—Mr. John B. Green in the chair—when the following report of the Directors was submitted.

The accounts, which will be presented to the meeting, will show the working of the Company during the past year, and its financial position on the 31st of December last. The balance-sheet, the revenue, and profit and loss accounts will be found on the other side.

For the quarter ended on the 31st of March last the Company received for water-rents £1119 4s. 5d., for the quarter ended the 30th of June last £1156 8s. 4d., and for that which ended on the 30th of September last £1312 9s. 9d. The rents for the quarter which ended on Dec. 31, 1878, are estimated to produce about £1250; the amount of water-rents for the year which ended on Dec. 31, 1878, will, therefore, be about £4836.

Taking into account the amount of water-rents due for the quarter which ended on the 31st of December last, the amount due from customers on the trade account, and the value of stock of coals and materials in hand, the Directors estimate that there was a profit for the year of about £1402. This being a clear income of more than 7 per cent. upon the share capital of the Company, is a result upon which the Directors think the Shareholders may fairly be congratulated.

Since the meeting of Shareholders in February last, the Directors have entered into a contract for the erection of the engine and boiler house for the sum of £3238, which sum they very much regret is greatly in excess of the amount they had hoped to get the work done for.

The erection of the engine and boiler house is now completed, except as to some internal work. The Directors had expected that the engine, boilers, and machinery would have been delivered, erected, and in operation before now; but there have been unavoidable delays in the delivery and erection of the engine and boilers. They have, however, now for some time been delivered at the works, and are in the course of being erected.

The whole of the 660 shares have been, in pursuance of the resolution of the meeting of Shareholders held on Nov. 8, 1877, offered to the ordinary Shareholders, and were all taken up by them, and four calls have accrued due. The Company have hitherto paid interest at the rate of 5 per cent. on the mortgage debt of £7500, but they have asked the mortgage creditors if they would be willing to accept interest at the rate of 4 per cent., to which they have all assented. Interest at the reduced rate will become payable as from January last.

Though the profit of the year 1878 has been much larger than that of the year 1877, the Directors do not feel warranted in recommending a larger dividend than that which was paid in 1877—namely 4 per cent., free of income-tax, upon the ordinary share capital of £20,000. They propose also that interest at the same rate of 4 per cent., free of income-tax, should be paid on the sums which have been paid on account of the 660 new shares, such interest to be calculated from the day of the payment of the respective calls up to the 31st of December last, the balance of £527 18s. 1d. of profit being paid over to the reserve-fund, which will then amount to £598 6s. 6d.

The year's accounts have been prepared in accordance with these recommendations.

The Directors think it desirable to state shortly some of the reasons which induce them to recommend what possibly some of the Shareholders may consider a lower rate of dividend than the accounts of the year would justify. 1. An exceptional part of the profits of the year arises from trade, and such profit cannot be relied upon in the future. 2. In future a dividend will have to be paid upon a much larger share capital, probably upon nearly 50 per cent. more. 3. There have been no extraordinary repairs or other extraordinary expenses during the past year, which is exceptional. 4. Until the new engine is in operation the works of the Company may be considered to be in a transition state. 5. It is very important to the interests of the Company to have a substantial reserve-fund to meet any extraordinary contingency.

In April, Mr. Arkcoll, who had been chairman of the Company since its formation in the year 1860, resigned the chairmanship, though continuing to hold office as a Director. The Directors have appointed Mr. John Barcham Green as Chairman, in the room of Mr. Arkcoll,

Mr. Laurence has resigned his directorship, and the Directors have appointed Mr. F. H. Simmonds to be a Director in his place.

Mr. Bentlif, one of the Auditors, goes out of office by rotation, and, being eligible, offers himself for re-election.

Messrs. Ellis, Monckton, and Wigan go out of office by rotation, and, being eligible, offer themselves for re-election.

The Chairman, in moving the adoption of the report, said the Directors had not succeeded in getting the new works into such a forward state as they desired. Considerable delay had occurred, and great difficulty was experienced in getting the new machinery at East Farleigh; but the Directors hoped that, in the course of the month of April, they might get the new works completed. He had to congratulate the Shareholders that day on the progress the Company were making. The income during the past year had been rather larger; but for various reasons mentioned in the report, the Directors, as business men, did not wish to pay a dividend of more than 4 per cent.

Mr. L. D. Wigan seconded the adoption of the report, which was agreed to.

In reply to a question, the Chairman said that since the frost they had had great trouble in the shape of wasting water. The Company were doing their best to stop the waste, and he hoped they might succeed; but loss of water was the trouble of all companies.

The Secretary (Mr. J. Case) in reply to a question, said that no substantial part of the town of Maidstone was beyond their limit. Some years since, when Barming Heath was enclosed, the Company became entitled to an allotment by right of their property, and they took the opportunity of getting the very highest site. The land was sufficiently large for them to erect a reservoir thereon, if required, and the structure, he believed, would be from 20 to 30 feet higher than their present reservoir. By this means they would be enabled to supply water were it could not be sent now. Of course the work could not be carried out without great expense, as mains would have to be laid a considerable distance, and the pumping would be a costly operation. But if the population of the town should increase, the Company would have to meet its wants by this means.

On the motion of the Mayor (Mr. C. Ellis, J.P.), seconded by Mr. Arkcoll, the accounts, as presented to the meeting, were ordered to be entered on the minutes.

Mr. L. D. Wigan proposed that a dividend at the rate of 4 per cent., free of income-tax, be paid on the ordinary share capital of the Company, the payment to be made on the 1st of April next.

Mr. W. Haynes, in seconding the motion, said the dividend recommended was not a sensational one, but it increased the confidence the Shareholders all felt in the Board of Directors.

The Chairman, in putting the proposition, which was agreed to, expressed a hope that the time would soon come when they might recommend a larger dividend.

The retiring Auditor and Directors having been unanimously re-elected,

The Mayor moved that the thanks of the Shareholders be given to Mr. C. Arkcoll for his services as Chairman of the Company for many years past.

Mr. Wigan seconded the motion, which was heartily carried.

Mr. Arkcoll, in acknowledging the vote, said he had taken great interest in the Company, and nothing but ill-health had caused him to retire. He was still as anxious for the welfare of the Company as he ever had been, and hoped it would continue to prosper.

The Chairman said he should only be too pleased to see Mr. Arkcoll well enough to take the chairmanship again, especially now that they seemed to have a happy future before them.

A vote of thanks to the Chairman brought the meeting to a close.

Sevenoaks Gas Company.—At the half-yearly meeting of this Company on Monday, the 24th ult.—Mr. E. E. Cronk in the chair—dividends were declared, of 10 per cent. upon the original shares, and 7 per cent. upon the new stock.

THE PLYMOUTH TOWN COUNCIL AND THE GAS COMPANY'S BILL.

At a Special Meeting of the Plymouth Town Council, on Thursday, the 27th ult.—the MAYOR (Mr. E. James) presiding—the following report of the Gas Committee was presented:—

The Gas Committee have to report that, in accordance with the resolution passed at the special meeting of the Council on the 8th of January last, they have endeavoured, by submitting terms for the consideration of the Plymouth and Stonehouse Gas Company, to avoid all opposition to the Bill the Company have now introduced into Parliament. They regret to say that their endeavours have been unsuccessful.

While the Company considered that certain of the terms submitted to them were fair subject for negotiation and arrangement, certain other of the terms—namely, those relating to the electric light and to the additional capital—the Company decline to discuss.

As to the electric light, the Committee suggested that, with the sanction of the Council, and in terms to be prescribed by the Council, the Company should have power to supply it, provided the electric light undertaking were kept entirely separate from the gas undertaking.

As to the additional capital, the Committee proposed that the Company should have a certain amount to carry 7½ per cent., but that it should be raised in the manner prescribed by Lord Redesdale in his model Gas Bill.

The Company not agreeing to these proposals, the Committee then urged that if they met in conference the result might be to arrive at an agreement on all points except the electric light, and as it was proposed that a special Parliamentary Committee should deal with all the Bills relating to the electric light, it was quite possible the modification suggested by that Committee would be satisfactory to the Council, and in this way a contest might be altogether avoided.

The Company were, however, unable to see that any advantage would be gained by adopting this course.

As, therefore, it was not possible to come to an amicable arrangement, the Committee acted upon the further powers entrusted to them by the Council, and caused the preparation of the petition against the Bill to be proceeded with.

Throughout this negotiation with the Company, the Committee have been acting in concert with the Gas Committee appointed by the Stonehouse Local Board, and the joint Committee of the two public bodies have now arranged that the Council and the Local Board shall concur in opposing the Bill by the same petition.

The joint Committee also consider that the expenses of the opposition should be borne by the Local Authorities proportionately, according to the rateable value of the properties within their respective districts—namely, as to four-fifths by Plymouth, and as to one-fifth by Stonehouse—and this proportion your Committee now submit for adoption.

It was then proposed by Mr. MORRISH, seconded by Mr. LATIMER—"That the report now presented be received, and that the arrangements recommended by the Committee with reference to the joint action with the Local Board of East Stonehouse, in opposition to the Bill, be approved; and that the costs of the opposition be borne by the Local Authorities of Plymouth and Stonehouse respectively, in the proportion suggested."

An amendment—"That the Council pause before adopting the report, and not enter rashly into an excessive expenditure of the ratepayers money unless further effort be made to effect a compromise," met with the support of only three members, and was consequently lost.

The motion was then put to the meeting, and agreed to, with two dissentients; and it was afterwards ordered that the petition which had been prepared be sealed.

THE NEWCASTLE TOWN COUNCIL AND THE GAS COMPANY'S BILL.

At the Monthly Meeting of the Newcastle Town Council last Wednesday—the MAYOR presiding—the Parliamentary and Gas Committees reported that they had continued their negotiations with the Gas Company, in the hope that it might be practicable to effect an arrangement of those points on which a difference of opinion existed, and so that the heavy expense of a parliamentary contest might be avoided. They stated that they had received from the Company the following communication, which they placed before the Council for their consideration, and felt it only necessary to add that they recommended its acceptance to the Council, and that the opposition to the Bill be continued only to secure that the Bill be altered in conformity with the terms set out in the letter from the Company of the 4th of March, in addition to the concessions already agreed to by the Company, and that a Sub-Committee be appointed to watch the progress of the Bill in Parliament:—

Newcastle-on-Tyne and Gateshead Gas Company, March 4, 1879.

To the Chairman of the Parliamentary Committee.

Sir,—The Directors of the Gas Company understand that it would meet the requirements of the Parliamentary Committee of the Corporation if 3s. 4d. were fixed as the maximum price of gas as at present; the Gas Company not to divide more than 7 per cent. so long as the price of gas remains at or above the present rate of 2s. 9d. per 1000 cubic feet, less discount, but having power to divide 5s. per cent. for every 1d. per 1000 cubic feet which they shall charge below that price; and under these circumstances the Directors instruct me to say that, as it is not proposed to interfere with their standard price, they will not put the town to several thousand pounds expense for the sake of the sliding scale in its integrity. The Directors, however, in agreeing to these terms, have to place on record their opinion that the propositions originally submitted by the Gas Company were not unreasonable, but such as they consider the Corporation, as representing the gas consumers, might, in justice to the Proprietors of the Gas Company, have deemed satisfactory.—I am, your obedient servant,

(Signed) WM. HARDIE, Secretary.

Alderman WILSON asked the Council to consider and affirm the report. He said he was glad that they had not the heavy expenses of a contest to look forward to. The concession which the Company had made, he thought, and he hoped, would be satisfactory, not only to the members of the Council, but to the public generally. The standard remained the same as it was in their Bill, and they were to be allowed to divide 7 per cent. so long as the price of gas did not go below 2s. 9d. per 1000 feet. There would be a few matters of wording in some of the clauses that might require alteration; but he had no doubt they would be able to arrange everything in a friendly and satisfactory manner with the Company.

Mr. W. H. STEPHENSON, Chairman of the Gas Committee, seconded the motion.

Alderman GREGSON said he believed this particular concession was due to the high respect in which the Gas Company held the Town Clerk. He was very sure that if they had had another Town Clerk than the one to whom the Company looked up as an old friend, and the Corporation as a valued servant, they would have had a contest, and a very severe one.

Mr. BARKAS opposed the motion, contending that it would be more advantageous to the consumers, and ensure greater economy in the manufacture of gas, if the initial standard lay between 3s. and 3s. 4d., instead of 2s. 9d. and 3s. 4d. per 1000 feet. He moved an amendment to that effect.

Mr. STEPHENS seconded the amendment, and, after some further observations, it was rejected by a very large majority.

SALE OF EXETER GAS SHARES.

On Thursday, the 27th ult., there were offered for sale, by public competition, 400 five per cent. perpetual preference shares of the Exeter Gas-light and Coke Company, granted under the powers of the Exeter Gas Act, 1878, of the nominal value of £25 per share. There were 100 lots of four shares each. Under the conditions of sale, each lot was put up in the sum of £100, a deposit of £10 per cent. on the purchase-money being required to be paid to the Secretary of the Company, Mr. W. A. Padfield, and the balance to be paid to the Company's Treasurer, Mr. T. M. Snow, on or before the 31st of March.

The AUCTIONEER, in opening the sale, said it was not generally known what shares and capital belonged to the Company. They consisted of £7500 debenture stock, which it was optional with the Company to renew; £10,000 4 per cent. preference stock, the value of which, in July last, was £100 per cent.; £20,000 5 per cent. preference shares of £25 each, which he offered for sale in 1876, and which realized respectively £29 10s., £29 7s. 6d., and £29 5s.; and £10,000 5 per cent. 1878 preference shares of £25 each, which was the stock to be offered that day. The original capital of the Company represented £40,000, in shares of £25 each, recently sold for £48 and £50, paying 5 per cent. interest to the purchaser, whereas the Company paid 10 per cent. upon the original capital. The Company had done that in the past, and no doubt would do more in the future. The shares to be offered that day were granted under an Act of Parliament obtained last year, and were required for an extension of the works and new plant, so as to meet the constantly increasing demand of the city, and to put the whole concern in thoroughly good going order. A step in that direction had already been taken by the provision of a new gasholder and meter-house, and a new main had been laid as far as Exe Bridge. The new mains would be extended into the city, and the Company intended to provide a new retort-house, further new mains, new condensers, coal-stores, and engine and boiler houses. When these works were completed, the whole thing would be in thorough order, and the Company would be enabled to meet the requirements of the city for years to come.

The first 40 lots sold briskly at £105 each. The biddings for the next lot started at £103, and reached £105, at which it was knocked down. Lot 42 was started at £102 10s., and was knocked down for £104 15s. For the next lot £102 was bid, and it was sold for £104. The nine next lots were each put up at £103, and they brought respectively £103 15s., £103 10s., £103 5s., £103 5s., £103, £103, £103, £103, and £103. Lot 53 was sold for £102 10s., and lot 54 for £102. The five next lots realized £102 each, and the following five £102 5s. each. Lots 64 to 76, inclusive, were started at £102 each, and knocked down at that sum. Lot 77 went for £102 5s., and lot 78 £102. The three next lots sold for £102 5s. each. Lot 82 brought £102 10s., and lots 83 and 84 £102 5s. each. The nine following lots were knocked down for £102 10s. each. Lot 94 fetched £102 15s., and lot 95 £103. The biddings then became brisk again, lots 96 to 99, inclusive, selling for £103 10s., and the last lot for £104 5s.

THE PROPOSED PURCHASE OF THE MARGATE WATER-WORKS BY THE TOWN COUNCIL.

At the last meeting of the Margate Town Council, on Tuesday, the 25th ult.—the MAYOR (Mr. R. Wood) presiding—the Water-Works Committee reported that, having acted upon the instructions of the Council, and engaged the services of Mr. E. Easton, whose report confirmed their previous recommendation, they begged again to submit their report as to the purchase of the water-works, for the adoption of the Council.

Alderman KNIGHT, in moving the adoption of the report, said it was satisfactory to them to know that Mr. Easton fully maintained the opinion as to the advisability of effecting the purchase. It was very gratifying to find that the supply was ample and the quality good. Mr. Easton told them that it was perfectly wholesome water at all times, the only doubtful quality being its hardness. He also told them the property was worth the £59,000 asked for it; and as to the repayment of a loan for that amount, with interest, he (Alderman Knight) thought that could be done in 60 years out of the earnings of the works. Thus the works could be obtained at very little cost to the borough.

Mr. BAYLEY seconded the motion.

Mr. MUNNS supported the motion, and moved, as an addition to the Committee's recommendation—"That one of the terms of the bargain be that the Company shall obtain for the Council the right, in perpetuity, of tunnelling under the land in the valley, say for a distance of 500 yards from the well at the Windmill pumping-station, at a nominal rent." He hoped the Council would accept that addition, in order that that great question might pass with a unanimous vote.

Alderman CHAMBERS praised the water which could be obtained from the Dane Valley, which, he said, was the purest in England. He expressed the opinion that £59,000 was too large a sum for the works, and that the Council would be compelled to go to great expense in securing a good and plentiful supply.

Alderman PICKERING, Chairman of the Company, stated that the Directors would not entertain Mr. Munn's proposal, which was altogether beyond their power. So far as he was personally concerned, he would rather the Company retain the works in their own hands.

The amendment was then supported and opposed by the same number of votes—viz., 6; and, as the Mayor is a Shareholder in the Company, he could not vote. The original motion was then carried by a majority of 7 votes to 4.

CLEVEDON WATER-WORKS COMPANY.—The ordinary general meeting of this Company was held on Thursday, Feb. 27—Sir A. H. Elton, Bart., in the chair. The Directors report and balance-sheet, being of a favourable nature, were approved and adopted. The revenue for the year ending Dec. 31, 1878, amounted to £1524 13s. 5d., as compared with £1348 1s. 5½d. in 1877, and £1272 4s. 6½d. in 1876. A dividend at the rate of 5½ per cent. per annum, free of income-tax, was declared, the sum of £60 added to depreciation and repairs fund, and the balance of account (£56 16s. 7d.) carried to the credit of next year's account; the total balance of profit being £798 6s. 7d. The retiring Directors—Sir A. H. Elton, Bart., and Messrs. R. Godwin and J. L. Stothert—were re-elected, as was also the Auditor, Mr. C. J. Ryland.

NORMANTON GAS COMPANY.—The half-yearly meeting of this Company took place on Saturday, the 22nd ult.—Mr. W. Statter in the chair. The balance-sheet for the half year ending Dec. 31, 1878, showed that the expenditure had been £853, against an income of £1583, thus producing a profit of £730. To this was added a gain of £29 on over-estimated bad debts. From the total a dividend was recommended at the rate of 7½ per cent. per annum, which would swallow up £750, and leave £10 to be applied to the reserve-fund, which would then stand at £1026. The Chairman, in moving the adoption of the report and the payment of the dividend, pointed out that the consumption of gas showed a decrease of 325,000 feet over the corresponding half year. He did not consider, under all the circumstances, that the decrease was a very large one. The leakage last half year was equal to 15 per cent., which was rather heavier than usual; but drainage and other works had been going on in the district, and that accounted for the leakage being considerably larger than in the previous half years. The total income for the past half year was £1583 8s. 2d., as against £1691 11s. 2d., or about £100 less. The amount received for gas accounts was £1307 0s. 2d., as against £1440 10s. 6d. The balance of profit was £730 5s. 5d., as against £753 3s., or about £23 less than in the corresponding half year of 1877. Alluding to the reserve-fund, there was the sum of £1776 14s. 8d. to be dealt with, and the Directors recommended that the usual dividend of 7½ per cent. per annum should be paid, which would absorb £750, and leave a balance of £1026 14s. 8d., as against £885 9s. 6d. at the corresponding period in 1877. The motion having been seconded, was agreed to, and the usual votes of thanks closed the proceedings.

SOUTHERN DISTRICT ASSOCIATION OF GAS ENGINEERS.

The First Quarterly Meeting for this year of the above Association was held at the Guildhall Tavern, London, on Thursday, Feb. 13.

Votes of thanks were passed to Mr. J. ELDRIDGE (Richmond), the retiring President; and to Mr. J. L. CHAPMAN (Harrow), the Hon. Secretary.

Mr. J. WEST (Maidstone), the President, not being able to be present, on account of illness, the following Address which he had prepared, was read by the Secretary:—

Gentlemen,—I thank you for the honour you have conferred upon me in electing me to occupy the presidential chair of this Association. I consider it both an honour and privilege to hold that position, and trust I may be enabled to perform the duties appertaining to it to your entire satisfaction, feeling assured that I may count with confident expectation upon the hearty support and cordial assistance of the members collectively.

I think we may now say that the Association is firmly established, and again congratulating ourselves upon its continued success. The members have increased in numbers during the past year, 49 names being now upon our books. This increase has rendered it necessary for the Committee to make arrangements for our meetings to be held in a larger room.

We are very pleased with the addition to our Association of several of the London Engineers, whose names and good deeds are so familiar to all of us; and the members will undoubtedly be much benefited by the information given, and the light they will throw upon many of the subjects under discussion.

At this point I should like to state that the wish of the Committee is, that the original object and idea of the promoters of this Association should be rigidly adhered to, especially as the course hitherto pursued has been proved to be so valuable to the members in general. Our valued friend, Mr. Alfred H. Wood, of Hastings, who occupied the Presidentship for the first and second year of our existence, when encountering some of the difficulties usually attached to the starting of a new project, was extremely anxious that we should clearly understand each other at the outset, and I cannot do better than quote his own words:—"It is distinctly understood amongst us that our meetings should be of the most communicative character. We are anxious to drop as much of formalities as it is possible to do, consistent with the interest and object of our meetings, and to show as little reserve, and to throw open for each other's use all those details in gas manufacture which could not be done in a more extensive association in a way we can do in our mutual gatherings."

Up to the present time we have carried out these ideas to the letter, and it has often happened that most of the members in the room have added some valuable information to the discussion. Some have thought that if the Association became too large, many of the original objects for which it was started would be impaired. When, however, we find such to be the case, it will then be necessary for us to meet the difficulty. This imagined difficulty will, I think, be avoided by other associations being formed in various important centres, where members may conveniently meet together.

Some have thought that the admission of so many eminent Engineers, would prevent the younger and more diffident from giving expression to their opinions. Up to the present time, such has not been the case; on the contrary, I fully believe that their kind suggestions have often brought out some of their ideas, instead of repressing them.

We have been favoured during the past year by a continued discussion upon a paper read by Mr. Brett, of Hertford, "On the Steam-Jet Exhauster;" also a paper by Mr. J. L. Chapman, our indefatigable Secretary, "On the Carbonization of Coal," with special reference to the retort-house. A meeting was also held at our Secretary's works, at Harrow, in May last.

The Committee arranged n November for the members to inspect and examine the electric light invented by Mr. Werdermann, previous to attending a dinner, which it is intended in future to make an annual institution.

I have been requested to make a few remarks upon the important question of the relations between gas companies and consumers. It would appear, from all that has been published in the newspapers, that gas companies and corporations have not received that consideration they were fairly entitled to at the consumers hands, seeing that the former have supplied the public, for nearly three-quarters of a century, with the purest and cheapest light that science has invented. Gas companies were suddenly called upon to account in various ways for sins of omission and commission. This, however, is the customary prelude to which gas companies are accustomed when some new and visionary scheme is about to be propagated.

The electric light is the great luminary which was about to extinguish us all in this case. And here I wish to state that, as Engineers and scientific men, we have no objection to any invention that may be introduced for the benefit of the public at large, but we do object to the amount of trash that has been written, which has undoubtedly caused the unwarrantable "scare" amongst those connected with the gas interest, brought about by the misleading statements of the promoters, and afterwards dilated upon in such admirable style by the London and local press. These statements have, however, induced directors and shareholders to take a greater interest in gas matters than heretofore. They can see that Local Authorities in some districts would hail a competitor with delight, believing that it would upset what they term a monopoly; forgetting that gas companies are under the most rigid legislative restrictions that can be imposed upon them—restrictions which are thought by some to be alike disadvantageous to the companies and the public.

The question then comes—Have we, as Engineers and Managers, done all in our power in advising our Companies to take such a course as would further their own and the consumers interests generally? It may be said that the task of pleasing so many customers would be nearly impossible. I am keenly alive to the difficulties that would be met with, but at the same time I believe it could be accomplished in the majority of cases; at any rate, an effort ought to be made in this direction.

My own opinion, which is founded upon considerable experience, is, that gas companies, besides making good gas, should feel themselves morally bound, in their own and the consumers interests, to do everything in their power to ensure the gas being properly consumed, and use every opportunity to further their business by introducing all improvements in the gas-burners, cooking and heating apparatus, gas-fittings, and every appliance that may be utilized and used in the consumption of gas. To accomplish this, it is necessary to keep a well-stocked show-room, and thoroughly efficient workmen to properly fix and adjust the various fittings and apparatus on the consumers premises. It has been the custom with a few of the companies and corporations to do this work from their formation, the companies and the consumers being equally benefited thereby; for in these towns you will find the most improved apparatus employed, and the work done in a good and substantial manner.

In our show-rooms at Maidstone we keep a stock of gas-fittings, and all recent improvements in burners and cooking and heating apparatus. For the last 19 years it has been our custom to let out the cooking-stoves upon hire, and this has considerably increased our daily consumption of gas. Most of these stoves have been made upon the premises; others have been purchased from firms who, of late years, have made cooking and heating stoves their special study. About three years since, I introduced a very simple and effective gas-fire, 170 of which are in use at the present time.

Formerly, chandeliers, &c., had to be sent to the manufacturers to be re-lacquered, causing great inconvenience to the consumers; and special lights, which, as a rule, are mostly required in a great hurry, had to be obtained from the same source. This delay caused great dissatisfaction. We now do the whole of this class of work upon the premises, and keep an efficient staff of workmen to enable us to attend at once to all complaints that are sent to us by consumers, or are brought in daily by our collectors, foremen, or inspectors. Thus we often obtain an opportunity of rectifying bad fittings, introducing new burners, &c., by which means the complaints are reduced to a minimum.

I know it may be argued by some that this is not the business of a gas company, and should be done by the tradesmen of the town. My answer to this is, that when you find tradesmen do their work well, they should be encouraged in every way, as they are furthering the gas interest. Unfortunately, there are many tradesmen who take up gas-fitting as a business, without any previous knowledge of it. The result is that pipes are fixed much too small for the number of lights they have to supply, and the work is generally faulty, the consequence being that the gas company in most cases are blamed for inefficient supply, and for sending out gas deficient in illuminating power; whereas, upon investigation, in nine cases out of ten, the fault is found to be from the above-mentioned causes, over which the company have no control.

I contend that gas companies have an unbounded right to further their interests, and to attend to the wishes of their numerous consumers in every possible manner. Much good has been done in advancing this, by the various exhibitions of cooking apparatus at North Shields, Birmingham, and in other towns. At these exhibitions, while numerous improvements were shown, it was also discovered that some stoves of excellent design and workmanship, were most ineffective, and revealed the fact that the makers of them did not properly understand the combustion of gas; hence the importance of gas engineers giving this subject their special consideration.

You would doubtless consider me remiss in my duty if I omitted to say something respecting the electric light. I will, therefore, very briefly make a few comments upon it before passing on to more important subjects connected with our profession.

Those Engineers who visited Paris in connection with our parent Association saw the electric light under the most fascinating and favourable circumstances. The Société Générale d'Electricité invited us to visit their establishment to inspect the various appliances necessary for producing the light, and we ascertained that the necessary force required was upwards of one-horse power per light. We were also informed that they had arranged with the Municipality to charge them 1s. per candle per hour for the light. We could not discover the exact cost of production, but many of us came to the conclusion, after making careful calculations, that the Société were supplying the light at a great loss to themselves. This has been confirmed by Mr. James N. Shoolbred, B.A., in his paper read before the Society of Arts, where he states that the Authorities of the City of Paris showed the cost to be 2·6 times that of gas, as supplied in Paris, which we know is about double the price of London gas.

We are also very much indebted to Mr. E. F. Davis, a private gentleman, who, at his own expense, arranged for carrying out experiments upon his estate at Westgate-on-Sea, with a view of ascertaining whether the electric light was practicable for public lighting; also to arrive at the cost of the same as compared with an equal amount of light from gas. The gentlemen selected to conduct the experiments were Mr. W. H. Bennett and Mr. W. A. Valon, whose names are sufficient testimony that the experiments would be carried out with exactitude and impartiality. We learn from their exhaustive report, that the cost of the electric light in this case is five times that of the London gas at 3s. 6d. per 1000, when giving the same amount of light. They have also come to the conclusion that "if electricity is to be the light of the future, it must be produced by a radically different system to any yet brought before the public."

The Chartered Gas Company have also been carrying on experiments, and we are much indebted to them for making them of a public character. From a report just issued, I find they have been lighting one of their large rooms with the electric light, under the most favourable circumstances, and even then the cost was four times as much as gas of an equal illuminating power.

In these experiments it must be observed that nothing is charged, in the accounts of the electric light, for interest on working capital, depreciation of buildings or cable, and I presume a little should be added for profit, which would add very much to the cost already given for producing the light.

In November last, as before stated, our Committee made arrangements for our inspection of the Werdermann light, when Mr. Werdermann described the means he employed in subdividing the light, and answered in a very cordial manner any questions put to him. Those present will bear me out in saying, that the approximated power of the light was very much exaggerated, and the amount of force required was also, as usual, kept in the background.

For more minute details on this subject, I must refer you to papers so ably written by Mr. A. H. Wood and others, to the experiments at Westgate-on-Sea and at the Chartered Gas Company's works, and likewise to a paper read by Mr. R. P. Spice to the Society of Engineers, on Feb. 3, the whole of which will be found in the JOURNAL OF GAS LIGHTING.

One argument of the promoters of lighting by electricity is that their light is more applicable for large illuminations, and where great areas have to be adequately lighted, and these statements were accepted by the public in general, until the Phœnix Gas Company, at the suggestion of their enterprising Engineer, Mr. C. Woodall, resolved and obtained permission to light up the Waterloo Road, to show what illuminating power gas was capable of producing when consumed by large burners and under favourable conditions. At the most important points, Mr. Sugg's large Argand burners, ranging from 50 to 200 candle power, were employed; and at the intermediate distances, lamps with opal tops were arranged closer together than usual, and batswing burners of suitable size for producing perfect combustion were used. All who have seen this lighting have pronounced it to be a great success.

The Chartered Gas Company have also carried out this new system of street illumination, having fixed a number of Mr. Sugg's improved lanterns and burners between Pall Mall and Piccadilly Circus. These exhibitions have brought about a change of opinion in the public, and gas shareholders feel reassured now they see that gas is capable of producing an illumination equal to the electric light, that it is much cheaper, and far superior for public lighting generally. The thanks of the gas community are, therefore, due to these gentlemen for inaugurating these valuable experiments, and we may also thank the electricians for giving us an opportunity of displaying the utility and power of gas when properly used. The public now understand that vestries and public bodies can thoroughly

light the thoroughfares with gas if they are prepared to pay a little extra for it.

The advisability of using the recently improved gas-engines as a motive power for driving gas-exhausters, &c., has been brought forward in the JOURNAL, and deserves our attention and consideration. I have recommended their use in our district, where several small ones are at work, and from what I have seen of them, I am convinced that they are most efficient and economical. A few days since I ascertained the cost of gas used for driving these engines, and I append the results, as they may be useful:—

No. 1.—3½-horse power Otto silent gas-engine, used for driving two large lathes, planing machine, circular saw, and grindstone. 70 cubic feet of gas per hour.

No. 2.—2-horse power Otto silent gas-engine pumps 2000 gallons of water 100 feet high per hour. 50 cubic feet of gas consumed per hour. Left without attention for hours.

No. 3.—3½-horse power Otto silent gas-engine, with the latest improvements. In engineer's shop, and works two lathes, one drilling machine, fan for blacksmith's forge, and grindstone. 55 cubic feet per hour.

Experiments have also been made very recently with an 8-horse power Otto, when the consumption of gas used was found to be 24 cubic feet per horse employed.

An important meeting of this Association was held at the Guildhall Tavern on the 23rd of January, to which directors were invited, to consider what would be the most advisable course to take in disposing of their coke, in view of the new Weights and Measures Act coming into operation. The subject was fully discussed, as will be seen from the report in the JOURNAL. In matters of this kind, we feel that our District Association is very valuable to the Companies whom we represent.

Up to the present I have been dealing with matters connected with gas chiefly outside the works. It will now be well to refer to the paper read by our Secretary "On the Carbonization of Coal," with special reference to the retort-house. This being the most important part of our gas plant, and where the dividends have to be made, it is therefore very essential that it should receive our first and earnest consideration.

That important strides have been made in the retort-house of late years, is patent to all Gas Engineers; but there still remains very much to be done. The discussion upon the paper named, revealed the fact that many of us were working in our own particular way and under various conditions, although most of us were using Newcastle coals. Certainly there must be a way superior to all others; I therefore consider that there is scope for many more papers connected with the retort-house, and invite the members to take up the subject of the Siemens and other furnaces, the proper area of flues and chimneys, the size and shape of retorts and whether short or long retorts are the more advantageous. Also the best temperature for distilling Newcastle or other kinds of coal, and if it is advisable to dispense with the hydraulic main. I have White's patent automatic valves, fixed so that I may dispense with the main, if necessary, and at the present time the valve works with great success.

You are aware that I have given the retort-house my especial care and study for some years past, and for your information and encouragement I am sure you will be pleased to know that my efforts have been most successful with my drawing and charging apparatus, working in the new retort-house, which has been in action some months, and that the economy effected has far exceeded anything that my friends or myself have stated or anticipated.

Next in order is the condenser. The shape, extent, and cheapest form are well worth serious attention. Although two meetings were occupied in discussing a paper read by Mr. Brett "On the Steam-Jet Exhauster," it is thought by some that we should like to have more information upon this important subject.

Then comes the very important question of washers and scrubbers, of which several forms have been introduced. I have adopted the Livesey washer in the arrangement of our new works. It is a small and very inexpensive vessel, and I am informed, by those who have it in use, that it does excellent work, and is a great auxiliary to the water scrubber. It is to be hoped that Mr. Livesey will be successful in his experiments, and be able to produce an equally effective and inexpensive water scrubber.

We next come to the purifying plant, where, in the ordinary purifying process, the "sulphur" bugbear has to be dealt with, and where its removal is compulsory. A considerable amount of chemical skill is required to meet the many difficulties that here present themselves.

I shall be glad to see the time when cumbersome open vessels, requiring frequent changing of purifying material, can be dispensed with, and this part of the process carried out in closed purifiers. Some experiments in this direction have been, and I believe are still being carried out at the South Metropolitan works, and also by Mr. Hammond, of Lewes, who has kindly sent me the results of his last successful experiment, and these I now lay before you:—

Cost of Gas Purification,

With Automatic Ammonia Apparatus, and the Gas passing through Two Lime Purifiers, 10 feet square,
From Nov. 10, 1878, to Dec. 25, 1878—37 days.

Gas made, 37 days	6,500,000 cubic feet.	—	
Coals used	684 tons	—	
Lime used	80 × 3 = 240 bushels	£5	0 0
Purified per bushel of lime	27,083 cubic feet	—	
Purifiers opened three times, loss of gas	6000 cub. ft. at 4s. 7d.	1	7 6
Removing foul lime	at 5s. 8d.	0	17 0
Sulphur average	8 to 12 grs. per 100 ft.	—	
		£7	4 6

0·26d. per 1000 cubic feet.

Cost of Gas Purification

With Ordinary Apparatus, and the Gas passing through Two Lime Purifiers, 10 feet square,
From Dec. 25, 1878, to Jan. 30, 1879—37 days.

Gas made, 37 days	5,500,000 cubic feet.	—	
Coal used	579 tons	—	
Lime used	80 × 7 = 560 bushels	£11	13 4
Purified per bushel of lime, say 9892.	10,000 cubic feet	—	
Purifiers opened seven times, loss of gas	14,000 c. ft. at 4s. 7d.	3	4 2
Removing foul lime	at 5s. 8d.	1	19 8
Sulphur average	20 grs. per 100 feet.	—	
		£16	17 2

0·73 per 1000 cubic feet.

The above results were obtained by using an experimental apparatus, capable of dealing with only 50 gallons of liquid per hour, automatically prepared by the waste steam from the engine. The foul gas—sulphuretted hydrogen—was delivered from the apparatus, and measured by meter at the rate of 60 to 70 cubic feet per hour; the carbonic acid was condensed into crude carbonate of ammonium, and a small quantity of a volatile hydrocarbon oil. By this method of coal gas purification, naphthaline is unknown, the quality of the gas is greatly improved, and, strange as it may appear, the public-lamp glasses remain clean for double the ordinary time. Occasionally sulphuretted hydrogen was absent from the outlet of the clean-water scrubber; and, without doubt, the strong alkali ammonia used as described in my specification was capable of dealing with all the ordinary impurities of coal gas as effectually as the materials more generally used for purifying purposes.

If such results can be continuously maintained upon a large scale, Mr. Hammond will have relieved us from many difficulties, and I trust he will be rewarded for his zealous investigations.

At Maidstone we are under no restrictions for sulphur compounds; nevertheless, the sulphur fever rages there very strongly, and the subject is brought before the public in a very erroneous and misleading manner. The Directors decided, however, when enlarging their works, to arrange for the removal of the sulphur compounds, and some of you are aware that I made experiments which I considered of great importance, because they would enable us to purify our gas from the "objectionables," without causing much nuisance, and at the same time continue to use a large proportion of oxide in the process. To do this it was necessary to arrange the purifiers so that they could be worked in any order. I consulted four of the most eminent chemists of the day, and they considered that the experimental results obtained were rational, and advised that I should carry out my plan upon a large working scale.

I anticipated that I should be able to lay the results of my working before the members at this meeting, and, in fact, promised to do so; but I regret to say that the Contractor has only just completed the purifiers, whereas they should have been working three months ago. I will, however, give you the outline of my plan, and, if your purifying plant will allow, I think it would assist the objects of this Association, if those who feel interested in the subject were to work out a series of experiments for themselves, so that eventually we might compare the results for our mutual information.

You are aware that up to the present time sulphide of calcium (CaS) is the material used for taking out the sulphur compounds from gas on a manufacturing scale, and the practice is to turn foul gas into a clean lime purifier, to abstract the carbonic acid (CO_2) and sulphuretted hydrogen (SH_2). The former compound converts the lime into calcium carbonate (CO_3CaO)—a useless material, when once found in our purifying-boxes; the latter forms, with the lime, calcium sulphide (CaS), which we utilize for abstracting the sulphur compounds. The carbonic acid in the gas, however, from its greater chemical affinity, energetically displaces the sulphur from the lime existing as sulphide of lime, enters into fresh combination with the lime, and forms the useless carbonate. It is necessary, therefore, to keep your partially sulphide purifiers free from carbonic acid, by continually placing clean purifiers in front, for its removal. I found, however, when I saturated the lime with sulphuretted hydrogen, and converted it into a sulphide quite free from carbonic acid, that it would remove the sulphur compounds from a very large volume of gas, if the same were passing through quite free from sulphuretted hydrogen and carbonic acid.

Having first got the purifiers sulphuretted as described, I work them in the following order:—

1. Oxide for sulphuretted hydrogen.
2. Sulphide of lime which absorbs the carbonic acid.
3. Sulphide of lime for the sulphur compounds.
4. Clean lime, which, absorbing some of the constituents of the first lime purifier, broken up by the CO_2, and driven forward with the gas, is being partially prepared in its turn to act as a sulphide purifier.

Finally, the gas goes through the check oxide purifiers, to arrest anything that may come over with it.

This breaking up and displacing in the first lime purifier I allow to go on until it shows carbonic acid freely, when I know that it is then mostly carbonate, and, therefore, of no use in the purifier, and in that state can be unloaded with very little nuisance, which, in my case, is very important, the works being situate in the heart of the town.

There are some important topics, introduced by our late President, Mr. J. Eldridge, which I should like to have touched upon, but time will not permit me to do so.

Looking at the gas interest generally, I consider that it is in a very satisfactory state, and that a great future lies before us. As I have previously stated, much has been done, but still more remains to be accomplished.

Our American friends, who visited us during the summer, consider the English works to be built in a good and substantial manner, and they are of opinion that if the English system of purification and the French plan of carbonization were blended, we should have a nearly perfect set of works.

It is thought by some that the legislative restrictions imposed upon gas companies are a stumbling-block to improvements, and that, in some cases, both directors and engineers are content when the maximum dividends are secured. I would advise all such to follow the example of those companies who have shown an interest in their undertaking, who, after securing their dividends, have benefited their consumers by reducing the price of gas.

I am inclined to think that there is a special inducement to directors and engineers to progress, where the sliding scale is in operation, and a chance of mutual benefit being obtained by all parties.

Undoubtedly, the surest policy of a gas company is to keep their works in first-class condition, use all the most modern and approved appliances for producing good and cheap gas, do all in their power to oblige their customers, and they will then have the satisfaction of knowing they have performed their duties to all parties concerned.

I may mention that a gas analyst's manual is about to be published, emanating from our respected friend, Mr. F. W. Hartley. From our previous knowledge of him, we may rest assured that it will be all that can be desired, and of great utility, both as a work of reference and of practical memoranda.

The thanks of our Association are due to Mr. Chapman, the father of our respected Secretary, for the handsome and cordial way in which the members were entertained when visiting the Harrow Gas-Works.

The Committee think it would be desirable to meet at each other's works once during the summer months, for mutual advantage; and I shall esteem it an honour if the Members of the Association will pay me a visit at Maidstone as soon as convenient.

Mr. A. H. WOOD (Hastings) proposed, Mr. G. LIVESEY (London) seconded, and it was resolved—"That the thanks of this meeting be given to the President for his Address, and that the same be printed."

ABERDARE AND ABERAMAN CONSUMERS GAS COMPANY.—The nineteenth half-yearly meeting of this Company was held on Thursday, the 27th ult. —Mr. John Johns in the chair. In accordance with the report of the Directors, it was decided to declare a dividend for the half year at the rate of 6 per cent. per annum, which would absorb £900; to place £400 to the reserve-fund, which would then stand at £2111 19s. 11d.; and to carry forward a balance of £914 19s. 5d. The retiring Directors and Auditors were re-elected, and a vote of thanks to the Chairman closed the proceedings.

REDUCTIONS IN THE PRICE OF GAS.—The Croydon Gas Company have resolved to reduce the price of gas from 4s. to 3s. 10d. per 1000 feet. The Blackpool Corporation have, on the recommendation of the Gas Committee, reduced the price of gas from 4s. 2d. to 3s. 9d. per 1000 feet.

RIPLEY GAS COMPANY.—The ordinary general meeting of this Company was held on Tuesday, the 25th ult.—Mr. G. Staley presiding. The report was very satisfactory. A dividend of 9s. 3d. per £5 share, and a bonus of 1s., were declared. The retiring Directors, Mr. G. Staley and Mr. W. Burton, were unanimously re-elected, and Mr. G. Day was re-elected Auditor.

CARDIFF GAS COMPANY.—The eighty-fourth half-yearly meeting of this Company was held on Tuesday, the 25th ult.—Mr. C. W. David in the chair. The report of the Directors was adopted, which contained a paragraph stating that, should the present state of the coal market continue, they would be enabled to reduce the price of gas from the 24th of June next. A dividend was declared at the rate of 10 per cent. per annum on the A stock; 8 per cent. per annum on the B stock; and 7 per cent. per annum on the paid-up capital created by the Act of 1870. The thanks of the meeting were voted to Mr. H. Bowen, the Managing Director, and also to the Chairman and Directors for their attention to the interests of the Company.

SALE OF GAS SHARES AT BRIGHTON.—At a meeting of the Brighton and Hove Gas Company, on September the 8th last year, the Directors were authorized to raise additional capital, and they determined to raise £25,000, by the issue of 1250 ordinary A shares of £20 each, with a dividend limited to 7 per cent. per annum. The new capital is required for extensions and for general purposes, consequent on the increased business of the Company. Last week one half—viz., 625 shares—were submitted for sale by public auction, and great interest was manifested in the proceedings, the lots meeting with a ready sale. There were 313 lots, each, with the exception of one, consisting of two shares. The average price realized for the lots was under £50, the maximum being £50 10s., and the minimum £48. The total amount realized was £15,200.

RICHMOND (SURREY) GAS COMPANY.—The half-yearly meeting of this Company was held on Thursday, the 27th ult.—Mr. F. Chapman in the chair. The Secretary (Mr. E. B. Blott) read the following report:—"The Directors beg to present to the Shareholders the accounts, containing a statement of the affairs of the Company for the year 1878, and, in doing so, have to congratulate them on the satisfactory results shown therein. They recommend that a dividend be declared, for the half year ending 31st of December last, of 5 per cent. on the original capital, and 4 per cent. on the new capital; making for the year 10 per cent. on the original capital, and 8 per cent. on the new. Two of your Directors retire by rotation—namely, Messrs. Frederick Chapman and Thomas James Carless. Both are eligible, and offer themselves for re-election. Your Auditor, Mr. Pugh, retires by rotation, and offers himself for re-election." The Chairman, in moving the adoption of the report and balance-sheet, congratulated the Shareholders on the financial condition of the Company. Owing to the extremely bad weather, the Gas Companies all over the country had been in a most prosperous condition. What had been unfortunate for the public generally had been fortunate for the Company, for they had been enabled to earn sufficient money to pay a full dividend, and put by something for the reserve-fund, should there be more adverse times, and the dividends threaten to fall short. He then referred to the electric light, and the effect it had had in calling attention to the cheapness and adaptability of gas for illuminating and other purposes. After the adoption of the report and declaration of the dividends therein proposed, it was agreed to increase the salary of the Secretary by £50 a year, and he was complimented upon his past services. The retiring Directors and Auditor were then re-elected; and votes of thanks were passed to the Board, and to the Chairman for presiding.

TETBURY GAS COMPANY, LIMITED.—At the first half-yearly meeting of the Shareholders in this Company, on Thursday, the 27th ult.—Mr. R. C. Paul in the chair—the following report was read:—"The Directors present to the Shareholders their first half-yearly report, together with their statement of accounts. The trade account shows a profit of £206 9s. 4d., which, with the cash balance of £53 16s. 3d., and the value of 20 tons of coal, estimated at £17 11s. 8d., handed over by the Tetbury Gaslight and Coke Company on their transfer to this Company, makes a total of £277 17s. 3d. The Directors propose to appropriate this amount as follows:—

In payment of a dividend at the rate of 7 per cent. per annum on the paid-up capital of £4300	£150 10 0
To set aside by way of reserve-fund	25 0 0
And the balance to the next half year's account . . .	102 7 3
Total	£277 17 3

The Directors have pleasure in being able to present so satisfactory a report of the past half year's operations." It was then unanimously resolved—"That the report of the Directors and statement of accounts now read be received and adopted, and that the proposals contained in such report be and the same are hereby approved and confirmed;" "That a dividend after the rate of £7 per cent. per annum, free of income-tax, upon the paid-up capital of the Company, for the half year ending Dec. 31, 1878, be now declared and payable forthwith;" and "That the best thanks of the Shareholders be given to the Directors, the Secretary (Mr. G. Pride), and Manager (Mr. H. Philpot), for their careful attention to the interests of the Company." A vote of thanks to the Chairman terminated the proceedings.

APPLICATIONS FOR LETTERS PATENT.

807.—WRIGHT, F., Westminster, "Improvements in gas apparatus." Feb. 28, 1879.

880.—ANDRÉ, G. G., Dorking, Surrey, "Improvements in and connected with electric lamps." March 1, 1879.

876.—SPENCE, J. B., Lombard Street, London, "Improvements in the mode of and apparatus for producing light by electricity." March 5, 1879.

887.—NORRIS, A., Finsbury Park, London, "A new or improved material or compound to be burnt in lamps for illuminating purposes." March 6, 1879.

PATENTS WHICH HAVE PASSED THE GREAT SEAL.

3997.—DOWSON, J. E., Claverton Street, London, "Improvements in apparatus for the manufacture of gas." Oct. 10, 1878.

5183.—LAKE, W. R., Southampton Buildings, London, "Improvements in and relating to electric lighting apparatus." A communication. Dec. 17, 1878.

PATENTS WHICH HAVE BECOME VOID

BY REASON OF THE NON-PAYMENT OF THE ADDITIONAL STAMP DUTY OF £50 BEFORE THE EXPIRATION OF THE THIRD YEAR.

132.—CROSSLEY, F. W., "Improvements in gas motor engines." Jan. 12, 1876.

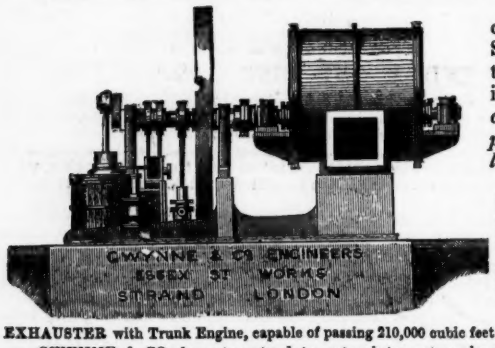
137.—LAW, H., "Improvements in air-vessels, valves, and regulators, for the supply of water to water-closets, urinals, and lavatories, which are also applicable to other purposes." Jan. 13, 1876.

188.—STEEL, J., "Improvements in the manufacture of gas, and in the machinery or apparatus employed therefor." Jan. 18, 1876.

207.—KIDD, J. H., "Improvements in the process of, and arrangements and machinery for, treating excreta, house refuse, and sewage sludge, to obtain manure and other products therefrom." Jan. 19, 1876.

The GRAND MEDAL of MERIT at the VIENNA EXHIBITION, TWO MEDALS at the PHILADELPHIA EXHIBITION and TWO MEDALS at the PARIS EXHIBITION, have been AWARDED to GWYNNE & CO. for GAS-EXHAUSTERS, ENGINES, and PUMPS; Also 27 OTHER MEDALS AWARDED at all the GREAT INTERNATIONAL EXHIBITIONS.

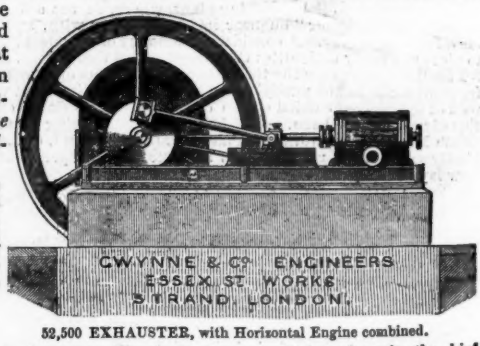
GWYNNE & BEALE'S PATENT GAS-EXHAUSTERS & ENGINES.



EXHAUSTER with Trunk Engine, capable of passing 210,000 cubic feet per hour.

The Judges report on the combined Exhauster and Steam-Engine exhibited at the Philadelphia Exhibition is—"*Reliable compact Machine, well adapted for the purpose intended, of excellent workmanship.*"

GWYNNE & CO. have made the largest and most perfect Gas-Exhausting Machinery in the world, and have completed Exhausters to the extent of 8,000,000 cubic feet passed per hour, of all sizes from 2000 to 210,000 cubic feet per hour.



52,500 EXHAUSTER, with Horizontal Engine combined.

GWYNNE & CO. do not pretend to enter into a struggle with other makers in respect to cheapness. They have never sought to make price the chief consideration, *but to produce machinery of the very highest quality, and most approved design and workmanship.* The result is that in every instance their work is giving the fullest satisfaction. Numerous testimonials and references can be given to Companies using their Machinery for years past.

Exhausters, with or without Engines combined, can be made to pass the gas WITHOUT OSCILLATION OR VARIATION IN PRESSURE Regulators, Bye-Passes, Stop-Valves, Gas-Valves, Station Governors, and Gas Machinery of all Sizes.

PLEASE ADDRESS IN FULL, GWYNNE & CO., Hydraulic and Gas Engineers,
ESSEX STREET WORKS, VICTORIA EMBANKMENT, LONDON, W.C., ENGLAND.

Gwynne & Co.'s New Catalogue on Gas-Exhausting and other Machinery may be obtained on application at the above Address.

TO GAS ENGINEERS.

D. BRUCE PEEBLES & CO.

Beg to call the attention of Gas Engineers to the fact that the novel and original feature in connection with PEEBLES' SYSTEM OF CONTROLLING THE ACTION OF GAS GOVERNORS is the loading or acting on the Bell by Pneumatic Pressure instead of Weights.

TAY WORKS, BONNINGTON, EDINBURGH.

WANTED, Readers of the NEW Edition, 1879, "Cooking & Heating by Gas;" on Burners, &c. Copies, by post, Threepence, direct from the Author, MAGNUS OHREN, A.I.C.E., Gas-Works, SYDENHAM, S.E.

WANTED, by the Advertiser, a Re-engagement as Foreman or Inspector, Collector, and Meter-Fitter. First-class testimonial.
Address H. B., 144, Lambeth Walk, LONDON.

WANTED, by a Competent Man, a Situa-tion as INSPECTOR or TESTER. Thoroughly understands Wet and Dry Gas-Meters, Governors, &c.
Address No. 530, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, a Re-engagement as MANAGER or MANAGER and SECRETARY in a medium-sized Gas-Works. Five years in last situation. Satisfactory reasons for change.
Address No. 531, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, a Situation as Gas Manager. Had over 20 years experience, and 8½ years in present employment. Understands all branches connected therewith. Good testimonials. Satisfactory reason for change.
Address No. 522, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

GAS-MAKER.

WANTED, as such, a competent Man, with good references as to character and ability. Wages, 18s. per week, with cottage, and an allowance of coal and vegetables.
Apply, stating age, experience, and whether married or single, with testimonials, to Dr. GILLAND, Berks Asylum, WALLINGFORD.

WANTED, a good Fitter; one com-petent to do Main and Service Laying, Meter Fixing, Repairs and Inspection, Internal Fittings in Iron and Compo. Handy at Smith's work, and able to do the repairs on a works where an exhauster is in use. Testimonials as to abilities and sobriety indispensable.
Apply, enclosing recent testimonials, stating full particulars, in own handwriting, as to wages, &c., to HARRY WINHURST, Manager, Gas-Works, Sleaford, LINCOLNSHIRE.

WANTED, by a Young Man (married), a Situation as MANAGER, or Secretary and Manager, of a small Gas-Works, or Assistant in a larger one. Has had considerable experience in the Manufacture and Distribution of Gas in all its branches; five years sole Manager. No objection to any place in the United Kingdom. Satisfactory reasons for change. Unexceptional references and testimonials.
Address, in first instance, No. 526, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

TO GAS-FITTERS.

WANTED, an active Young Man as Assistant GAS-FITTER; able to Fix Meters, attend to consumers complaints, do ordinary Fitting-Work, and Lay Services, &c. To work under an experienced Fitter. Must have had some experience of similar duties. One from the Provinces preferred. Wages to commence at 26s. per week, and the engagement will be permanent for an efficient man.
Apply, with copies of testimonials as to character and abilities, to Mr. W. T. CARPENTER, Manager, Sheppy Gas Company's Works, West Minster, near SHEERNESS.

BOROUGH OF SOUTHPORT.

WANTED, a Gas Manager. He will be required to devote the whole of his time to the duties of his office, and to reside at Crowlands Gas-Works. House, coals, gas-rates, and water free.
Applicants must state age, experience, and salary required. The annual make of gas is about 170 million cubic feet. Duties to commence 1st of May next. Personal canvassing not allowed.
Applications, endorsed "Gas Manager," must be forwarded to me on or before March 22, 1879.
By order,
KNIGHLEY WALTON, Town Clerk.

TO GAS COMPANIES.

THE Advertiser seeks an Engagement in one of Her Majesty's Colonies, or in any salubrious Country abroad, as CHIEF CLERK or otherwise. Has been 14 years under present employers; for the last 12 years as Chief Clerk and Cashier. Thoroughly conversant with Double Entry, Gas-Fitting Accounts, and Preparing Balance-Sheets, &c. Good writer and very quick at figures. Would engage for a term of years. First-class references from present employers. Applications entertained for the next three or four months, if not previously engaged. Age 38. Married.
Address No. 532, care of Mr. King, 11, Bolt Court, Fleet Street, LONDON, E.C.

EXHAUSTER FOR SALE.

FOR SALE, an Engine and Exhauster combined, to pass 7000 feet per hour, together with, Boiler, 12 ft. by 4 ft. Boiler fittings, connections, regulator to steam-pipe, and stone bed.
For particulars apply to W. T. TEW, Gas-Works WARWICK.

THE Directors of the Egremont Gaslight Company are desirous of receiving TENDERS for a new GASHOLDER, Wrought-Iron RETORT-HOUSE ROOF, &c.
Plans and specifications and conditions may be seen at their Office, after the 12th inst.
Tenders, endorsed outside, to be sent in to the Chairman not later than Monday morning, the 31st of March next.
The Directors do not bind themselves to accept the lowest or any tender.
By order,
JOSEPH GELDERT, Secretary.
Gas-Works, Egremont, Cumberland, March 8, 1879.

CHARD GAS AND COKE COMPANY, LIMITED.

THE Directors of the above Company are prepared to receive TENDERS for LEASE of their Works for a term of 10 or 14 years.
Endorsed tenders to be delivered on or before the 2nd of April.
The Directors do not pledge themselves to accept the highest or any tender.
Particulars may be obtained of Mr. J. CATFORD, Secretary

THE Gas Committee of the Leeds Cor-poration are prepared to receive TENDERS for the Supply of about 6000 feet of CLAY RETORTS, 20 in. by 14 in., 100,000 FIRE BRICKS, &c.
Forms of tender and other information can be had on application to Mr. H. Woodall, Engineer.
Tenders to be addressed to the Chairman, Gas Offices, Boar Lane, Leeds, not later than the 18th inst.
The Committee do not bind themselves to accept the lowest or any tender.

THE Committee of the Gas Commis-sioners, Inverness, are prepared to receive TENDERS for Two PURIFIERS, 12 feet square, with Covers and Lifting Gear complete.
Plans and specifications to be seen with Mr. James Thomson, Manager.
Sealed tenders endorsed "Tender for Purifiers," to be lodged and addressed to the MANAGER, will be received up to Monday, the 24th of March.
Gas-Works, Inverness, Feb. 28, 1879.

DARWEN CORPORATION.

TENDERS FOR RETORTS, BRICKS, &c.

THE Gas Committee of the above Cor-poration invite TENDERS for the Supply of 112 Retorts, and the Bricks, Fire-Clay, &c., necessary for Setting same.
Particulars and forms of tender may be obtained at this Office.
Sealed tenders, endorsed "Tender for Retorts, &c.," to be sent to C. Costeker, Esq., Town Clerk, Darwen, on or before March 31, 1879.
THOMAS DUXBURY, Manager.

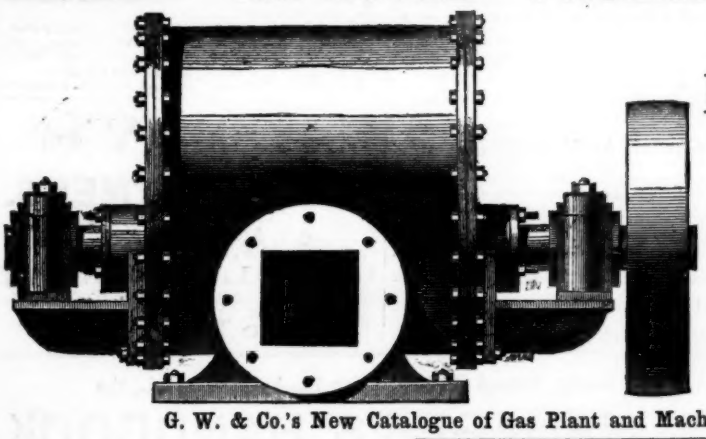
THE Local Board for the District of Sutton-in-Ashfield, in the county of Nottingham, require an experienced person as MANAGER of their Gas Undertaking. Commencing salary £100 per annum, with house, coal, gas, and taxes. The person appointed will be required to devote his whole time to the duties of his office.
Applications (in applicant's own handwriting), with testimonials, and stating when the applicant could enter on duty, to be sent to me, the undersigned, at my office, St. Peter's Church Walk, Nottingham, on or before the 19th day of March inst.
Canvassing not allowed.
By order of the Board,
D. W. HEATH, Clerk.
March 4, 1879.

BEALE'S IMPROVED PATENT GAS EXHAUSTERS,

WITH OR WITHOUT

WROUGHT-IRON SPINDLES AND

ENGINES COMBINED.



GEORGE WALLER & CO.,

MAKERS OF

ENGINES, EXHAUSTERS,
INDEX AND DISC GAS-VALVES,
HYDRAULIC MAIN VALVES,
BYE-PASS VALVES,
TAR, LIQUOR, AND OTHER PUMPS,
SCRUBBERS AND PURIFIERS,
CONDENSERS, BOILERS, &c.

G. W. & Co.'s New Catalogue of Gas Plant and Machinery can be had on application.

PHŒNIX ENGINEERING WORKS:

HOLLAND STREET, SOUTHWARK, S.E.

THE IMPERIAL METER COMPANY'S

LAMP REGULATORS,

FOR PUBLIC LIGHTING,

As supplied to the following and many other towns:—

Accrington, Barnet, Birkenhead, Bradford, Brighton and Hove, Burslem, Bury, Darlington, Dukinfield, Egremont, Harrogate, Hastings, Heckmondwike, Imperial (Hackney), London (Nine Elms), Longton, Newent, Shipley, Southampton, Southgate and Colney Hatch, Southport, Sowerby Bridge, Stockton, Stoke, Torquay, Tottenham, Wakefield, Western (Notting Hill, &c.), Whitchurch, &c., &c.

These superior Dry Governors or Street-Lamp Regulators, are substantially made and sensitive in action, carefully tested and adjusted to any required consumption per hour.

Price, £1 10s. per dozen, packed and delivered, if ordered in quantities of three dozen at a time.

THE IMPERIAL WET AND DRY GAS-METER WORKS,

KING'S ROAD, ST. PANCRAS, LONDON, N.W.

TENDERS FOR RETORTS, &c.

THE Gas Committee of the Dewsbury Corporation hereby invite TENDERS for the Supply and Delivery, at their Savile Town Gas-Works, of 800 lineal feet of Fire-Clay RETORTS, 20 in. by 15 in., and the necessary fire-bricks, fire-clay, &c.

Sealed tenders, endorsed "Tender for Retorts," &c., to be sent to Jesse Smith, Esq., Town Clerk, not later than noon of Wednesday, the 19th day of March, 1879.

The Corporation do not bind themselves to accept the lowest or any tender.

Further information may be had on application to the undersigned.

CHARLES ARMITAGE, Engineer and Manager.

TO IRONFOUNDERS.

THE Gas Committee of the Corporation of Stafford are prepared to receive TENDERS for the following Cast-Iron Spigot and Socket PIPES, viz.:—

250 Six-in. Pipes, 9 ft. long, each to weigh . . . . . 2 cwt. 1 qr. 5 lbs.

40 Twelve-in. Pipes, 9 ft. long, each to weigh . . . . . 5 cwt. 2 qr. 20 lbs.

25 Fourteen-in. Pipes, 9 ft. long, each to weigh . . . . . 6 cwt. 1 qr. 8 lbs.

The pipes to be cast vertically, and tested by hydraulic pressure to 100 ft. head of water.

Tenders to be sent to the undersigned on or before the 22nd inst., addressed to the Chairman, Gas Committee, Gas-Works, Stafford.

JNO. STORER, Manager.

WINDSOR ROYAL GASLIGHT COMPANY.

THE Directors of this Company are prepared to receive TENDERS for the Supply and Erection of a Cast-Iron TANK and Telescopic GASHOLDER, 73 ft. 2 in. diameter and 18 ft. deep, with the necessary Excavations, Brickwork, &c.

Drawings and specification may be seen, and further information obtained, upon application to the Company's Engineer, at the Gas-Works, Windsor.

Sealed tenders, endorsed "Tender for Gasholder," and addressed to the undersigned, to be sent not later than Monday, March 31, 1879.

The Directors do not bind themselves to accept the lowest or any tender.

By order,
GEORGE CARTLAND, Secretary.

Victoria Street, Windsor, March, 1879.

RAMSGATE LOCAL BOARD.

THE Gas and Water Committee of the Ramsgate Local Board are prepared to receive TENDERS before the 13th inst., for a supply of soft CAKING COALS of the best quality for gas manufacture for One or Two years, delivered into ships in the Tyne or into carts on the quay of Ramsgate Harbour.

The quantity required for the first year is 8500 tons, second year 9500 tons.

Further particulars, with forms of tender, can be obtained on application to Mr. William A. Valon, Engineer and Manager of the Ramsgate Gas and Water Works, Hardres Street.

The Committee do not bind themselves to accept the lowest or any tender.

W. A. HUBBARD, Clerk of the Local Board.

March 1, 1879.

CITY OF HEREFORD.

TO FIRE-BRICK AND RETORT MANUFACTURERS.

THE Gas Management Committee of the Hereford Corporation hereby invite TENDERS for the Supply and Delivery, at the site of the new Gas-Works, by the 1st of June next, 60 Circular RETORTS, 1 ft. 6 in. diameter and 10 ft. long, together with the necessary bricks, fire-clay, &c., for setting the same, particulars of which may be obtained from the undersigned.

Tenders, endorsed on the outside, and addressed, "Chairman, Gas Management Committee," are to be sent in on or before Monday, the 31st inst.

The said Committee do not bind themselves to accept the lowest or any tender.

By order,
WILLIAM DAVIS, Engineer.

Gas Office, March 7, 1879.

ELLAND-CUM-GREETLAND GAS COMPANY.

TO IRONFOUNDERS.

THE Directors of this Company are prepared to receive TENDERS for the Supply of 100 Tons (more or less) of Cast-Iron PIPES with Turned and Bored Joints, in sizes varying from 6 to 3 inches.

The pipes to be delivered in quantities as may be from time to time agreed upon, the deliveries to extend until September, 1880. All the pipes to be coated with Dr. Smith's solution, and weight per yard to be duly specified.

Further particulars may be obtained on application to the undersigned, to whom tenders are to be sent, endorsed "Tender for Gas-Pipes," on or before Friday, March 14, 1879.

The Directors do not bind themselves to accept any tender.

W. A. WALKER, Secretary, &c.

Elland, March 4, 1879.

WINDSOR ROYAL GASLIGHT COMPANY.

THE Directors of this Company invite TENDERS for the Supply of 5600 Tons of GAS COALS (unscreened), to be delivered free at the Windsor Station of the Great Western Railway, such Coals to be of either of the following descriptions—viz., New Pelton, Pelaw Main, or Holmside.

The Contractor to state for which Coals he tenders, as none others than those specified will be received.

The Coals to be delivered as follows—viz., April and May, 300 tons each; June, July, and August, 400 tons each; September, 500 tons; October, November, and December, 600 tons each; January, February, and March, 1880, 500 tons each month.

A separate tender to be sent stating the price per ton for a Two years contract under the same conditions.

The tenders to be forwarded to me on or before March 31, 1879.

The Directors will not entertain any conditional tender, or be bound to accept the lowest or any tender.

By order,
GEORGE CARTLAND, Secretary.

Victoria Street, Windsor, March, 1879.

THE Gas Committee of the Leeds Corporation are prepared to receive TENDERS for the Supply of the following APPARATUS and MATERIAL:—

Contract 1.—Ten Purifiers, 30 ft. by 20 ft., with covers.

Contract 2.—Four lengths of H. Woodall's Hydraulic Main, containing in all 200 Valves.

Contract 3.—Twenty-three Roof Principals, for 70-ft. Span.

Contract 4.—Two 18-in. Four-Way Dry Centre-Valves.

Drawings, &c., can be had on application to Mr. H. Woodall, Engineer.

Tenders to be addressed to the Chairman, Gas Office, Boar Lane, Leeds, not later than the 18th inst.

The Committee do not bind themselves to accept the lowest or any tender.

TO IRONFOUNDERS.

THE Water-Works Committee of the Heywood Local Board invite TENDERS for the Supply of Turned and Bored IRON PIPES, as follows:—

2000	Yards . . .	12 inches.
1000	,, . . .	10 ,,
1500	,, . . .	8 ,,
1000	,, . . .	6 ,,
1000	,, . . .	4 ,,

Specifications may be seen and further information obtained on application to Mr. James Diggle, Water-Works Manager, Miller Street, Heywood.

Tenders to be sent in addressed to the Chairman, and endorsed "Tender for Pipes," not later than 6 p.m. on Monday, the 17th of March next.

The Committee do not bind themselves to accept the lowest or any tender.

JNO. BANKS, Clerk to the Local Board.

Office of the Local Board, Heywood,
Feb. 28, 1879.

MANCHESTER CORPORATION GAS-WORKS.

TO COLLIERY PROPRIETORS AND OTHERS.

THE Gas Committee will receive, not later than the 25th day of March next, TENDERS of GAS COAL of approved quality for delivery at their Works, situated at Gaythorn and Rochdale Road, over a period of One or more years, commencing from the 30th day of June next, and the Committee are now prepared to receive applications for permission to submit samples of the material proposed to be offered.

Sealed tenders, stating price and quantity proposed to be delivered at each works, and the rate and period of delivery, and endorsed "Tender of Gas Coal," must be addressed to the Chairman of the Gas Committee, and delivered at his office on or before Tuesday, the 25th day of March next.

The Committee do not bind themselves to accept the lowest or any tender.

By order,
JOSEPH HERON, Town Clerk.

Town Hall, Feb. 28, 1879.

COMMERCIAL GAS COMPANY.

NOTICE is hereby given that an ORDINARY MEETING of the Commercial Gas Company will be holden at the Cannon Street Hotel, in the City of London, on FRIDAY, the 4th of April, 1879, at Twelve o'clock at noon, to receive the Report of the Directors, to declare a Dividend, to elect Directors and an Auditor in place of those retiring, and for other business.

The Books will be closed for the transfer of Stock from the 22nd of March inst. to the 4th of April, both days inclusive.

By order of the Board,
EDWARD J. SOUTHWELL, Secretary.

Offices, Stepney, March 7, 1879.

CRYSTAL PALACE DISTRICT GAS COMPANY.

NOTICE is hereby given that the ORDINARY HALF-YEARLY GENERAL MEETING of this Company will be held at the Albion Tavern, Aldersgate Street, on THURSDAY, the 20th day of March inst., to receive the Report of the Directors, the Balance-Sheet confirmed by the Auditors, to declare a Dividend, and for general business.

The Chair will be taken at Half-past Three o'clock precisely.

By order of the Board,
MAGNUS OHREN, Secretary.

Lower Sydenham, S.E., March 3, 1879.

THE BRITISH GASLIGHT COMPANY, LIMITED.

NOTICE is hereby given that the HALF-YEARLY GENERAL MEETING of the PROPRIETORS of this Company will be held at this Office, on WEDNESDAY, the 26th inst., at One o'clock precisely, to transact the usual business, and to declare the Dividend for the Half Year ending the 31st of December inst.

Notice is hereby also given that the Transfer Books of the Company will be closed on the 14th, and re-opened on the 27th inst.

By order of the Court of Directors,
FREDERIC LANE LINGING, Secretary.

Chief Office, No. 11, George Yard, Lombard Street, London, E.C., March 5, 1879.

THE WEST KENT GAS COMPANY.

Offices, 237, Southwark Bridge Road, London, March 3, 1879.

NOTICE is hereby given that the ORDINARY GENERAL MEETING of the SHAREHOLDERS of this Company will be held at the Offices, as above, on MONDAY, the 17th inst., at Three o'clock in the afternoon, precisely, for the purpose of receiving the Directors Report and a Statement of the Company's Accounts for the half year ended Dec. 31, 1878; to declare a Dividend thereon; to elect two Directors and one Auditor. The Directors retiring by rotation are Messrs. James Page and Robert Rice, and the retiring Auditor is Mr. Edward Sandell, all of whom are eligible for re-election, and offer themselves accordingly.

By order of the Board,
ROBERT PEAKE KEYS, Secretary.

The Transfer Books will be closed from the 3rd until the 17th inst.

THE LONDON GASLIGHT COMPANY.

NOTICE is hereby given that the ORDINARY HALF-YEARLY MEETING of PROPRIETORS of this Company will be held at the Freemasons Tavern, Great Queen Street, Lincoln's Inn Fields, on WEDNESDAY, the 2nd day of April, 1879, at Twelve o'clock precisely.

Two Directors and one Auditor retire by rotation, and, being eligible, offer themselves for re-election.

The Transfer Books will be closed from Tuesday, the 18th day of March, until after the meeting.

At the conclusion of the Ordinary Meeting an Extraordinary Special Meeting of the Proprietors will be held, for the purpose of considering, and, if thought fit, approving of a Bill now pending in Parliament, intituled "A Bill to confer further powers upon the London Gaslight Company, and for other purposes."

By order of the Board,
A. J. DOVE, Secretary.

Dated this 5th day of March, 1879.

MEMORANDUM.—Proprietors must hold capital stocks or shares paid up to the amount of £250, to be qualified to attend these meetings.

CLEGG'S "Practical Treatise on Coal Gas." Fifth Edition, quite new; a bargain, 12s. 6d. Address J. ELDRIDGE, 54, Murray Street, HOXTON.

GAS COAL.

THE MIRFIELD COAL COMPANY are supplying GAS COAL of the best quality on trucks at their siding. This Coal contains 10 per cent. of Cannel, and, as analyzed by Mr. James Paterson, of Warrington, yields 12,600 *cubic feet of* 16·67 *candle gas, with* 1430 *lbs. of good Coke, per ton.* Ash in Coke, 1·88.

Apply to the MIRFIELD COLLIERY, Mirfield, NORMANTON.

BRAY'S

NEW BURNERS.

40, 50, 60, 70, and 80

CANDLE POWER.

See Page 381.

Now ready, Second Edition, price 7s., by post 7s. 3d., the

GAS MANAGER'S HANDBOOK.

By THOMAS NEWBIGGING, M.I.C.E.

Orders to be sent to

WALTER KING,

11, BOLT COURT, FLEET STREET, LONDON, E.C.

THE THAMES BANK IRON COMPANY,

(Successors to LYNCH WHITE,)

SUPPLY FROM STOCK

CAST-IRON RETORTS, SOCKET-PIPES for GAS or WATER PURPOSES, FLANGE-PIPES for STEAM, RAIN-WATER PIPES and GUTTERS, HOT-WATER PIPES and BOILERS, and all requisite Connexions for same; also LAMP-COLUMNS, LAMPS, WROUGHT FRAMES, WROUGHT-IRON TUBING, &c., &c.

All kinds of Gas-Works Apparatus and General Castings made to Pattern or Drawing.

ADDRESS—

OLD BARGE WHARF, UPPER GROUND STREET, LONDON, S.E.

COMMERCIAL GLASS WORKS, 27, WELLCLOSE SQUARE, LONDON, E.
CHEAPEST HOUSE IN THE TRADE
FOR
GAS GLASSES OF EVERY DESCRIPTION

Write for Lists, free on application to any part of the World.

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CLYDE TUBE WORKS, GLASGOW & COATBRIDGE.
OFFICES AND WAREHOUSE: 41, OSWALD STREET, GLASGOW.

WROUGHT-IRON TUBES AND FITTINGS
FOR GAS, STEAM, AND WATER.
Hot Water Tubes, Core Bars, Lap-welded Iron Boiler Tubes.
CAST-IRON PIPES for GAS & WATER.
Brass and Gun-Metal Fittings, Valves, Cutting and Screwing Tools, &c.

PATENT
MACHINE-MADE RETORTS.

B. GIBBONS, JUN.,
STOURBRIDGE.

TO COLLIERY-OWNERS, COAL FACTORS, AND OTHERS.

THE Directors of the Rochester, Chatham, and Strood Gaslight Company are prepared to receive TENDERS for the Supply of GAS COALS for One, Two, or Three years from the 1st of June next, according to particulars which may be had on application at the office, 56, High Street, Rochester. The quantity required will be 21,000 tons per year.

Tenders (on the Company's form, and marked "Tender for Coals") must be at the office before noon of Thursday, March 20, 1879.

W. SYMS, Secretary.

EXETER GASLIGHT AND COKE COMPANY.

TO CONTRACTORS.

THE Directors of the above Company are prepared to receive TENDERS for two 24 ft. square PURIFIERS, also two 20 by 16 ft.

Further particulars may be obtained on application to the Engineer at the Basin Gas-Works, and sealed tenders to be sent to me, the undersigned, on or before Saturday, the 15th day of March next.

The Directors do not pledge themselves to accept the lowest or any tender.

By order,
W. A. PADFIELD, Secretary.
Gaslight Offices, Exeter, Feb. 20, 1879.

STOCK OF THE BRISTOL UNITED GASLIGHT COMPANY.

MESSRS. H. R. FARGUS & CO. will SELL by AUCTION, in pursuance and under the provisions of the Bristol United Gas Company's Act, 1873, at their Saleroom, 4, Clare Street, in the City of Bristol, on Thursday, March 20, 1879, at Two o'clock precisely, £20,000 CAPITAL STOCK, issued by them under the authority of the above-named Act.

The Stock will be Sold in Lots of £100 each.

For Conditions of Sale, and any further particulars, apply to the AUCTIONEERS, Clare Street, Bristol; to the SECRETARY of the Company, Canons Marsh, Bristol; or to Messrs. BRITTAN, LIVETT, BOX, AND CO., Solicitors, Albion Chambers, Bristol.

PORTBURY, PATERSON, & CO.,
MANUFACTURERS OF
Improved Wet and Dry Gas-Meters,
ALSO PATENTEES OF
COMPENSATING WET METERS;
INDICATORS,
STATION AND TEST METERS TO ORDER
STREET-LAMPS AND FITTINGS.
WORKS: WATERBEER ST., EXETER

ECONOMY IN THE PRODUCTION OF GAS.
PLUTONIC CEMENT,
FOR JOINTING AND REPAIRING RETORTS AND OVENS *in* ACTION AND *out* OF ACTION.
A Pamphlet on the advantages of the above, with Modes of Application, References, Prices, &c., free by post, from the Sole Manufacturer,
WILLIAM RICHARDSON, Gas and Hydraulic Engineer, CHARLES HENRY STREET, and BISSELL STREET, BIRMINGHAM.

Now Ready, Price One Guinea,

PRECEDENTS IN PRIVATE BILL LEGISLATION
AFFECTING GAS AND WATER UNDERTAKINGS.

COMPILED BY MR. G. W. STEVENSON, C.E., F.G.S.

This Work contains information with regard to the practice of Parliament during the last fourteen years, in regard to most of the points on which differences arise in Opposed Bills for Gas and Water Undertakings, comprising—Authorized share and loan capital, Rates of dividend, Capitalization of profits, Term for the repayment of loans, Instances in which new shares are to be sold by auction and Exceptions to the Standing Order requiring new shares to be sold by auction, The limitation of back dividends, Illuminating power, Purity, Price, Notice before testing, The conditions under which the public supply of gas is regulated, Alteration of mains, Instances in which maps of mains are required, and All cases in which undertakings have been transferred, since 1845 in gas and 1865 in water, from Companies to Local Authorities.

In the Water Precedents will be found, in addition, The rates for a supply for domestic purposes, and the Rates for other than domestic purposes.

LONDON: WALTER KING, 11, BOLT COURT, FLEET STREET, E.C.

LIVESEY'S PATENT WASHER.

This apparatus effects the most intimate contact between the liquor with which it is supplied and the gas passing through it, resulting in the complete removal of all particles of tar, increasing the ammonia strength of the scrubber and condenser liquor, and removing a large proportion of other impurities—notably, carbonic acid. The Washer is intended to work in conjunction with a scrubber. It occupies little space, and is inexpensive. It has been in successful constant use for nearly three years, does not become clogged with tar or corroded by the action of the liquor or gases, it gives three inches of pressure, and only needs a supply of liquor to keep it in regular action without any further attention.

For Particulars and Prices apply to
Messrs. DEMPSTER AND SONS, ELLAND, HALIFAX, for the North;
Messrs. BAILEY, PEGG, AND CO., Bankside, LONDON, S.E., for the South;
Messrs. WILLEY AND CO., Commercial Road, EXETER, for West of England and South Wales;
Or to the PATENTEE, 589, OLD KENT ROAD, LONDON, S.E.

WANTED, by Samuel Thompson & Co., Colliery Office, Lancaster, APPLICATION for PRICES from Gas Managers who are prepared to receive Tenders for GAS COAL or CANNEL.

John Leigh, Esq., M.R.C.S., F.C.S., &c., &c., in his analytical report of S. T. & Co.'s Coal, says: "It is remarkable for its purity. I have scarcely ever examined a Coal containing so small a quantity of ash, and when Cannel of the best description is scarce, it may well replace this material."

TO INVESTORS IN STOCKS AND SHARES.

MESSRS. WRENN & Co., Brokers, Financial Agents, Auctioneers, &c., will be happy to negotiate for the Sale or Purchase of Gas, Docks, Water-Works, Canal and other securities on moderate terms. Periodical Sales by Public Auction, where equitable prices can be ensured. Holders of Local Provincial Gas and Water Shares are respectfully solicited to communicate with the above at their offices, 4, Copthall Chambers, LOTHBURY.

THE HYDRAULIC MAIN ENTIRELY SUPERSEDED.

AN increased yield of gas, and of augmented illuminating power, is obtained by employing WHITE'S AUTOMATIC VALVE, and dispensing with the Hydraulic Main, the tar of which, as is well known, absorbs the rich constituents of the gas, consequently, diminishes alike the quantity and quality.

Further particulars, &c., upon application to WILLIAM WHITE, Gas-Works, Aberaychan, MON.

A Pamphlet descriptive of the above method, post free, 5½d.

Price 28s., handsomely bound in Morocco, cloth sides, gilt edged and lettered.

THE FIRST VOLUME OF

KING'S TREATISE

On the Science and Practice of the Manufacture and Distribution of

COAL GAS.

Edited by THOS. NEWBIGGING, C.E., M.Inst.C.E., and W. T. FEWTRELL, F.C.S.

Orders received by WALTER KING, 11, Bolt Court, Fleet Street, London, E.C.

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MACHINE-MADE RETORTS.

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BY

THOMAS NEWBIGGING, C.E., M.I.C.E.,

WILL BE SENT POST FREE ON APPLICATION

TO

B. GIBBONS, Jun.,

STOURBRIDGE.

J. & H. ROBUS,

BUILDERS AND CONTRACTORS

FOR THE ERECTION AND REBUILDING OF GAS AND WATER WORKS,

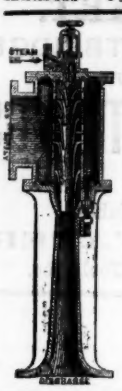
RETORT-SETTING—A SPÉCIALITÉ.

ROBUS'S IMPROVED RETORT-SETTINGS, guaranteed to Carbonize a large amount of Coal with a small per cent. of Fuel.

ESTIMATES GIVEN FOR MAIN-LAYING.

N.B.—All kinds of Fire Goods and Gas Apparatus supplied on the shortest notice.

Address:—J. & H. ROBUS, BELL GREEN, CATFORD, LONDON, S.E.



KÖRTING'S STEAM-JET EXHAUSTER.

IMPROVED CLELAND'S PATENT.

UPWARDS OF 300 IN USE.

CLELAND'S SLOW-SPEED CONDENSER & STEAM SCRUBBER

FOR PARTICULARS, APPLY TO

KÖRTING BROS.,

17, LANCASTER AVENUE, MANCHESTER,

OR TO

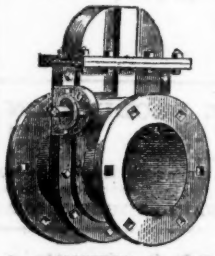
GERALD J. TUPP, Creek Engine-Works, Middle Mall, Hammersmith, London, W.

SOLE AGENT FOR ENGLAND AND WALES.

B. DONKIN & CO.'S

IMPROVED GAS-VALVES

WITH WROUGHT-IRON PINIONS.



List of prices, with full dimensions of all sizes up to 48-inch, to be had on application.

These Valves are proved on both sides to 30 lbs. on the square inch before leaving the works, and are kept in stock.

In ordering Valves, please state whether required for under or above ground, and if to be with flanges or spigots and sockets cast on, or with separate spigot and socket pieces.

ALSO SOLE MAKERS OF

J. BEALE'S NEW PATENT GAS EXHAUSTERS,

AND MAKERS OF

STEAM-ENGINES FOR DRIVING GAS EXHAUSTERS,

VALVES FOR AMMONIACAL LIQUOR,

IMPROVED BRIDGE VALVES FOR REGULATING THE SEAL IN HYDRAULIC MAINS,

BYE-PASS VALVES, SCREW WATER-VALVES, &c.

B. DONKIN & CO., 55a BLUE ANCHOR ROAD, BERMONDSEY, LONDON, S.E.

GAS COAL. GAS COAL. GAS COAL.

WELLS, BIRCH, RYDE, and CO., Limited,

HOYLAND SILKSTONE COLLIERIES,

Near BARNSLEY.

This Company is now in a position to raise 2000 tons per day of REAL OLD SILKSTONE GAS COAL.

"The quality of this Coal for Gas purposes, if equalled, is not excelled by any on record, and the Coke competes successfully with best Durham."—See *Mining Journal*, Aug. 11, 1877.

Prices quoted to any Railway Station, or F.O.B. Hull, Grimsby, Goole, Keadby, Liverpool, and Fleetwood.

Full particulars will be sent on application to above address.

LIVESEY FIRE-CLAY WORKS.

NEAR BLACKBURN, LANCASHIRE.

(ESTABLISHED 1835.)

ORLANDO BROTHERS, LIMITED,

MANUFACTURERS OF PATENT CLAY RETORTS,

AND EVERY DESCRIPTION OF

TUBULAR GLAZED SEWERAGE PIPES, BENDS, JUNCTIONS, ETC.

FIRE-BRICKS, TILES, BLOCKS, AND CHIMNEY-TOPS.

THE FARNLEY IRON COMPANY, LIMITED,

FARNLEY, near LEEDS,

MANUFACTURERS OF

FIRE-CLAY GAS-RETORTS & FIRE-BRICKS,

Of every size and shape, and of the best quality; also of White and Coloured GLAZED BRICKS, SANITARY PIPES, &c., &c.

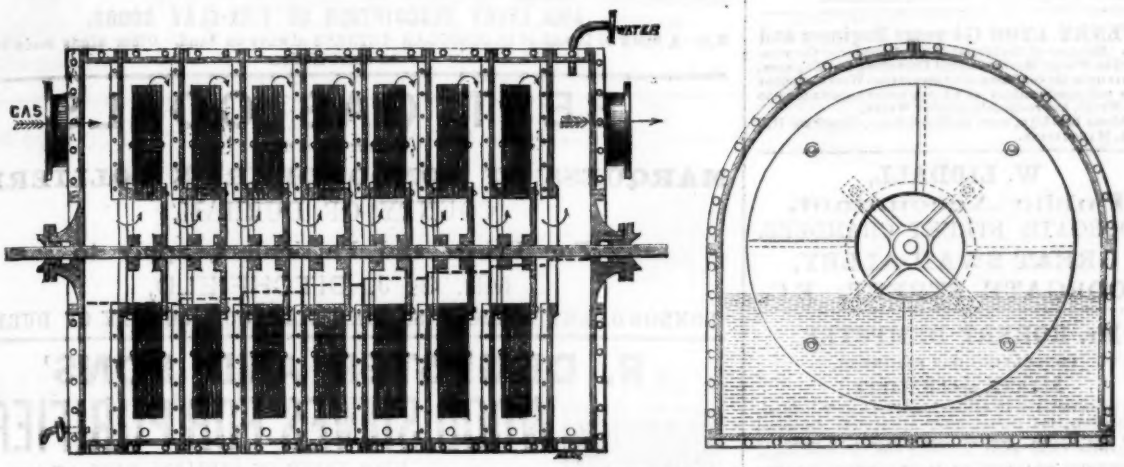
In order to meet the constantly increasing demand for their Gas-Retorts, the F. I. Co. have recently made such an addition to their premises as will enable them to execute expeditiously the largest home or foreign orders.

London Agent for Gas-Retorts: D. W. OGG, 3, Jeffrey's Square, St. Mary's Axe, E.C.

" " Glazed Bricks: A. BARFIELD, 22, Great George Street, Westminster.

THE "STANDARD" WASHER & SCRUBBER.

[KIRKHAM, HULETT, AND CHANDLER'S PATENT.]



This Washer and Scrubber has been used for nearly two years on a large scale at the Works of The Gaslight and Coke Company, Bromley-by-Bow, at which station there are now several in operation and in course of construction. There is also one in use at the Pancras Station, King's Cross, of the same Company, which is purifying 1,500,000 cubic feet of gas per day. At the Gas-Works of the Corporation of Leeds, a large one has been erected, which is giving complete satisfaction. The Special Merits of this Washer are as follows:—

That it is a very effective Condenser, so that it is not absolutely necessary to reduce the temperature of the gas to 60°, or thereabouts, to make the Washer effective.

That the distribution of the liquor is made with unerring regularity.

That it occupies very small space, so that it can be, at little expense, effectually protected from extreme changes of the weather.

That the considerable expense of Coke or Wood, or other Scrubbing Material, is entirely saved, and that the great nuisance and cost of from time to time replacing the Scrubbing Material is avoided.

That, by the revolution of the discs, the quantity of water carried up by them, and tending continuously to fall, exposes a very large amount of fresh wetted surface to contact with the gas.

That it is particularly adapted for Gas-Works where Sulphate of Ammonia is manufactured.

That it is much cheaper than any other Scrubber that will do the same amount of work effectually.

That it is the only Washer suitable for purifying Gas from all its impurities by solution.

That it works with a minimum of pressure.

That it takes out every trace of Ammonia from the Gas in once traversing the machine.

That it requires very little outlay for foundations.

The following Testimonials show the opinion of eminent Engineers as to the capabilities of the Washer:—

(Copy.) *The Gaslight and Coke Company*
D. HULETT, Esq. *Bromley-by-Bow, May* 3, 1877.

Dear Sir,—In answer to your inquiries respecting the results of the working of your Patent Washer, I beg to state that I find it a very efficient machine. I have had it in operation for some time, and passed gas through it continuously at the rate of 100,000 cubic feet per hour, and obtained from it 11 gallons of 10 oz. liquor per ton of coal carbonized—results which appear to me very satisfactory for so small a Washer. It works very smoothly, taking but little power, and giving no pressure. I have it still in operation, and am perfectly satisfied with its working.

I am, dear Sir, yours truly, (Signed) W. B. WRIGHT.

(Copy.) *The Leeds Corporation Gas-Works,*
Messrs. KIRKHAM, HULETT, and CHANDLER. *York Street, Leeds, Dec.* 6, 1878.

Gentlemen,—The Scrubber-Washer erected by you at these works, and which has been in use for six months, has proved to be, so far as we have been able to test it, thoroughly efficient. We are at present making 32,000 feet of gas per hour, and are entirely dependent on this apparatus for the removal of Ammonia, and the **Gas is perfectly free from that impurity in the sixth chamber,** so that four chambers remain to deal with an increasing make of gas. Owing to insufficient condensers, the gas was in the summer admitted to the Scrubber at a temperature of 70°, but was reduced therein to 61°, or that of the atmosphere. The volutes are driven at the rate of four revolutions per minute, and, working at that speed, there is not the slightest difference between the inlet and the outlet pressure. Clean water supplied at the rate of 10 gallons per ton of coal carbonized is converted into liquor of from 10 oz. to 13 oz. strength **in once traversing the vessel.** The apparatus is extremely simple and compact, occupies but little space, and requires no foundation. I shall be surprised if it does not eventually become extremely popular.

I am, Gentlemen, yours faithfully, (Signed) HENRY WOODALL, Engineer.

(Copy.) *The Gaslight and Coke Company.*
Messrs. KIRKHAM, HULETT, and CHANDLER. *York Road, King's Cross, Jan.* 14, 1879.

Gentlemen,—In reply to your inquiry, I am pleased to say, the Washer which was put in action at this station in October last has quite fulfilled my expectations, as it confirms the experiments I made in May last with the smaller machine. Working at four revolutions per minute, **it takes out every particle of Ammonia,** while purifying more Gas than it was intended to do. I enclose particulars of a fortnight's working during our heaviest make, by which you will see that it yields the full quantity and strength of liquor, and works with little pressure. I am therefore quite satisfied with the machine, and trust it may meet with the success it deserves.

I remain, Gentlemen, yours truly, (Signed) JOHN CLARK.

The following Table shows the results of the working of one of these Washers, lately erected to purify 60,000 *feet of Gas per Hour, at the St. Pancras Station of The Gaslight and Coke Company:—*

1879.	Nos. of the Divisions and Strength of Liquor in each.										Water used per Ton of Coals.	Gas Purified per Hour, Cubic Feet.	Ammonia on Outlet.	Temperature.			Pressures.		Revolutions per Minute.
	1	2	3	4	5	6	7	8	9	10				Inlet.	Outlet.	Atmosphere.	Inlet, Inches.	Outlet, Inches.	
	oz.	oz.	oz.	oz.	oz.	oz.	oz.	oz.	oz.	oz.									
January 1	8¼	6¾	5	3½	2¼	1½	¾	¼	0	0	10 Gallons.	52,000	Nil.	77°	73°	48°	24	24	7½
,, 2	8¾	7	6	4½	3¼	2½	1½	½	¼	0	10 ,,	57,000	Nil.	75°	66°	32°	21¼	20½	4
,, 3	9¼	8	6	3¾	3	2½	1½	¾	¼	0	10 ,,	60,000	Nil.	75°	63°	40°	23½	22	4
,, 4	9¾	7¾	6¼	4¼	3¼	2½	1¼	¾	¼	0	10 ,,	65,000	Nil.	74°	68°	33°	24	22½	5
,, 5	9½	7	6	4	3	2½	1¼	1	¼	0	10 ,,	34,000	Nil.	77°	68°	35°	14½	14	3
,, 6	9¾	7¼	6¼	4¼	3	2¼	1¼	1	¼	0	10 ,,	63,000	Nil.	72°	66°	27°	24	22½	4½
,, 7	11	9	7	5¼	3¾	3	1¾	1½	¼	0	10 ,,	39,000	Nil.	74°	66°	31°	25	23½	5
,, 8	9½	7½	6	4¼	3	2	1	¾	¼	0	10 ,,	78,000	Nil.	75°	61°	31°	28	26½	4¼
,, 9	11	9	7	5	3¾	2½	1¼	1	¼	0	10 ,,	82,000	Nil.	74°	67°	33°	27½	25½	5
,, 10	10¾	8½	6¾	5	3½	2¼	1½	1	¼	0	10 ,,	66,000	Nil.	76°	64°	28°	28¼	27	5
,, 11	12½	10	7¾	5¾	4¼	3¼	1¾	1¼	¼	0	10 ,,	81,000	Nil.	75°	64°	27°	26¾	25¾	5
,, 12	11	8¾	6½	—	—	—	1¼	¾	¼	0	10 ,,	39,000	Nil.	74°	64°	27°	26¾	25½	5
,, 13	13	10¾	8¼	6	4¾	3¼	2	1¼	¼	0	10 ,,	78,000	Nil.	73°	65°	42°	28	26	5

(Signed) JOHN CLARK, Engineer.

For further particulars and testimonials, address

Messrs. KIRKHAM & HERSEY, GAS ENGINEERS, 21, ABINGDON STREET, WESTMINSTER.

AMMONIACAL LIQUOR.

SPENCE and STEUART, Frizinghall, near Shipley, YORKSHIRE, are Purchasers of above.

FURNACE BUILDER AND RETORT SETTER.

W. HAILES Contracts for the Erection of Retort Benches, Settings of Retorts on all the most improved principles, in large or small works. Twenty years experience both in London and Provinces. Price List on application.
Address 3, High Street, Brentford, MIDDLESEX.

HENRY LYON (14 years Engineer and Manager of the largest of the Manchester Corporation Gas-Works) Mechanical and Consulting Gas Engineer, reports upon the condition and value of Gas-Works, supplies plans and specifications of all Apparatus appertaining to Gas-Works, and re-models existing Works.
Address Brooklyn, near Halliwell Lane, Cheetham Hill Road, MANCHESTER.

W. LIDDALL,
Public Accountant,
MOORGATE STREET CHAMBERS,
GREAT SWAN ALLEY,
MOORGATE STREET, E.C.

Mr. ROBERT DEMPSTER,
CONSULTING GAS ENGINEER,
ELLAND, near HALIFAX,
May be consulted on all matters connected with Valuations, Arbitrations, and Parliamentary Applications connected with Gas-Works. Having been engaged on extensive Arbitration Cases, which, combined with his experience in Construction and Contracting, his knowledge of Engineering and Valuations is both extensive and reliable.

ALFRED LASS,
SPECIAL ACCOUNTANT FOR GAS COMPANIES,
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Accounts analyzed and Statistics Prepared for Parliamentary Proceedings, Arbitrations, &c.
The Forms of Account, which have been specially designed to meet the requirements of the Gas-Works Clauses Amendment Act, 1871, are now in use by many Gas Companies, and have been universally approved.
The above forms are registered.
Water Companies Accounts also prepared and adjusted.
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Is acknowledged to be the best Barrow in the Market.
For particulars, with Drawings and Prices, apply to the Sole Makers,
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W. C. HOLMES & Co.,
ENGINEERS AND CONTRACTORS
FOR
GAS AND WATER-WORKS,
HUDDERSFIELD.

REFERENCES TO UPWARDS OF 400 WORKS.

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IRONFOUNDERS & MAKERS OF
CAST-IRON PIPES
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RETORT BOLTS,
AND ALL KINDS OF
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SUPPLIED BY
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ALFRED ST., BOAR LANE, LEEDS.

JOHN HALL AND CO., STOURBRIDGE,
Manufacturers of FIRE-BRICKS, LUMPS, TILES,

AND EVERY DESCRIPTION OF FIRE-CLAY GOODS.
N.B.—A Stock of 15 and 16 in. CIRCULAR RETORTS always on hand. Other kinds made to order on short Notice.

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DIRECT FROM THE
MARQUESS OF LONDONDERRY'S COLLIERIES,
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For Prices and Particulars, apply to
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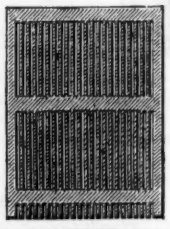
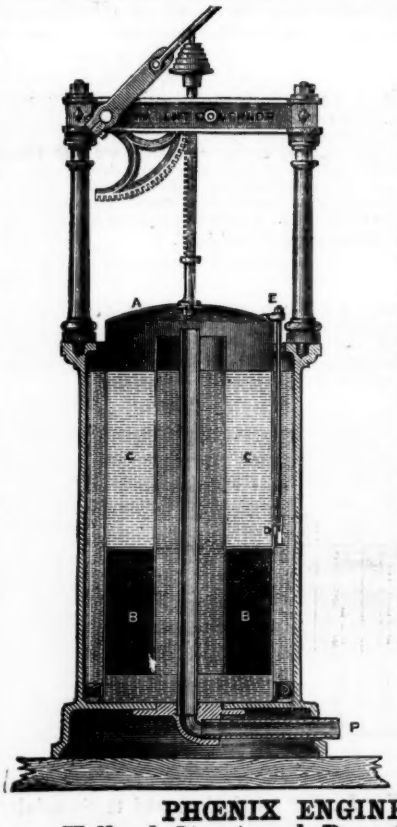
LONDONDERRY OFFICES, SEAHAM HARBOUR, COUNTY OF DURHAM.

R. DEMPSTER AND SONS'



WOOD SIEVES FOR PURIFIERS,
WITH TAPER OR PARALLEL BARS,
MADE BY SPECIAL MACHINERY.
SCRUBBERS FILLED WITH BOARDS,
On our approved principle, for the extraction of Ammonia.
Prices on application. References to First-Class Engineers.
ROSE MOUNT IRON-WORKS,
ELLAND, NEAR HALIFAX.
LONDON OFFICES: 2, SUFFOLK LANE, CANNON STREET, E.C.

GEORGE WALLER & CO.,
GAS AND HYDRAULIC ENGINEERS,
Patent Compensating Steam Governor,
WITH SELF-CONTAINED WATER-BALANCE.



DESCRIPTION OF THE APPARATUS.
The illustration represents a section of the Patent Governor. The lower part of the Bell A is fitted with a loose Float B, and in the upper part of the Bell is a deep annular Water Chamber C, at the bottom of which is an opening D, with a slide outside regulated by a Screw Spindle E, to allow the water to pass in and out of the Chamber C quickly or slowly, according to circumstances, but when once adjusted the slide does **not require altering.** This Self-compensating Chamber gives great steadiness to the up and down movement of the Bell and effectively prevents the "hunting" motion so common with other Governors, thereby ensuring a more perfect action on the throttle-valve of the Engine **than attained by any other.** The sketch shows the clip lever fixed to work on throttle-valve at an angle, and can work in either direction. P is the Gas Inlet-pipe to Governor.

G. W. & Co. also make **special Steam Throttle Valves,** suitable for working with this Governor, and alter existing Throttle Valves to same plan.

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45, OXFORD STREET, LONDON, W.

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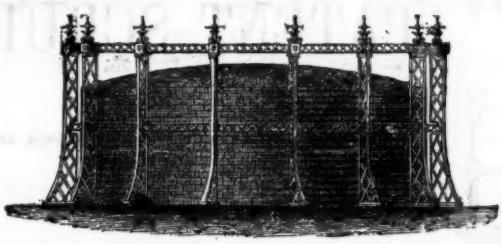
WALL LIGHTS, AND LUSTRES FOR GAS AND CANDLES.

TABLE GLASS OF ALL KINDS.

CHANDELIERS IN BRONZE AND ORMOLU. MODERATOR LAMPS.



THE HORSELEY COMPANY,

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TIPTON, STAFFORDSHIRE.

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MANUFACTURERS OF

GASHOLDERS, WROUGHT AND CAST IRON TANKS, CONDENSERS, PURIFIERS, SCRUBBERS, MAINS, RETORT-LIDS, PLAIN AND DISHED LAMP-POSTS, PIPES,

AND ALL REQUISITES FOR EITHER

GAS OR WATER WORKS;

ALSO

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AND MANUFACTURERS OF

PUMPING MACHINERY of every Description.

SOLE LICENSEES AND MANUFACTURERS FOR GREAT BRITAIN OF

BLAKE'S PATENT STEAM-PUMPS,

More than 10,000 in use,

ESPECIALLY ADAPTED FOR USE IN GAS AND CHEMICAL WORKS, FOR PUMPING TAR, WATER, AMMONIACAL LIQUOR, ACIDS, &c.

The following are some of the prominent advantages of the BLAKE PUMP:—

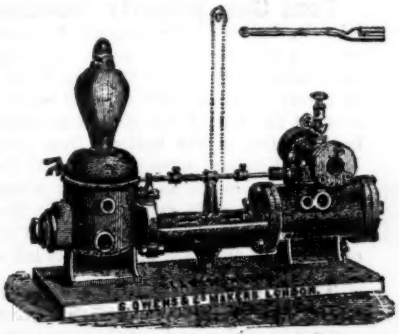
It will start at any point of stroke.

It has no dead point.

It works fast or slow, with the same certainty of action.

It is economical. Has a lead on the slide-valve.

It is compact and durable.



It is interchangeable in all its working parts.

It will deliver more water than any other pump.

It is made of best materials in the most workmanlike manner.

Can be worked at 20 strokes per hour, or 200 strokes per minute.

This Illustration represents Boiler-Feed Pumps, Sizes Nos. 1, 2, and 3, with Hand Lever for working Pump when Steam is not available.

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MANN & OWENS

IMPROVED PATENT GAS-VALVES.

PRICED LISTS AND FULL PARTICULARS FURNISHED ON APPLICATION.

YEO'S PATENT ENGINE PACKING,

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Tarred & White Spun Yarn for Pipe Joints, at various prices.
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BUYERS OF COAL TAR,

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Manufactory for every description of Casting and Machinery for Gas-Works and Water-Works.

Warehouse in London for Cast-Iron Pipes and Connexions of all sizes and in any quantity, Scott's Wharf, Bankside, Southwark.

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Keep in London and at their works large stocks of PIPES and CONNEXIONS (1½ to 36 inches in diameter); also make and supply Retorts, Tanks, Columns, Girders, Special Castings required by Gas, Water, Railway, Telegraph, Chemical, Colliery, and other Companies.

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SILICA FIRE-BRICK CO.,

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Near SHEFFIELD,

Manufacturers of THE ORIGINAL SILICA OR DINAS FIRE-BRICKS. Specially adapted for Gas-Retort Furnaces and for Siemens's Gas-Furnaces. Shipments promptly executed to London, Liverpool, Hull, Grimsby, &c.

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FIRE CLAY & BRICK WORKS,

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Manufacturers of GAS-RETORTS, GLASS-HOUSE FURNACE & BLAST-FURNACE BRICKS LUMPS, TILES, and every description of FIRE-BRICK.

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BEST GLASS-HOUSE POT and CRUCIBLE CLAYS.

Successors to

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PROPRIETORS OF THE

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Manufacturers of all Descriptions of

BEST STOURBRIDGE FIRE-BRICKS, LUMPS AND CLAY RETORTS

Of all Dimensions for Gas-Works,

GLASS-HOUSE POTS & CRUCIBLES

ESTABLISHED 1836.

The Highest Award was obtained by H. & M., at the Philadelphia Exhibition, 1876, for Superior Quality of Manufacture. SILVER MEDAL, PARIS, 1878.

GAS AND WATER PIPES.

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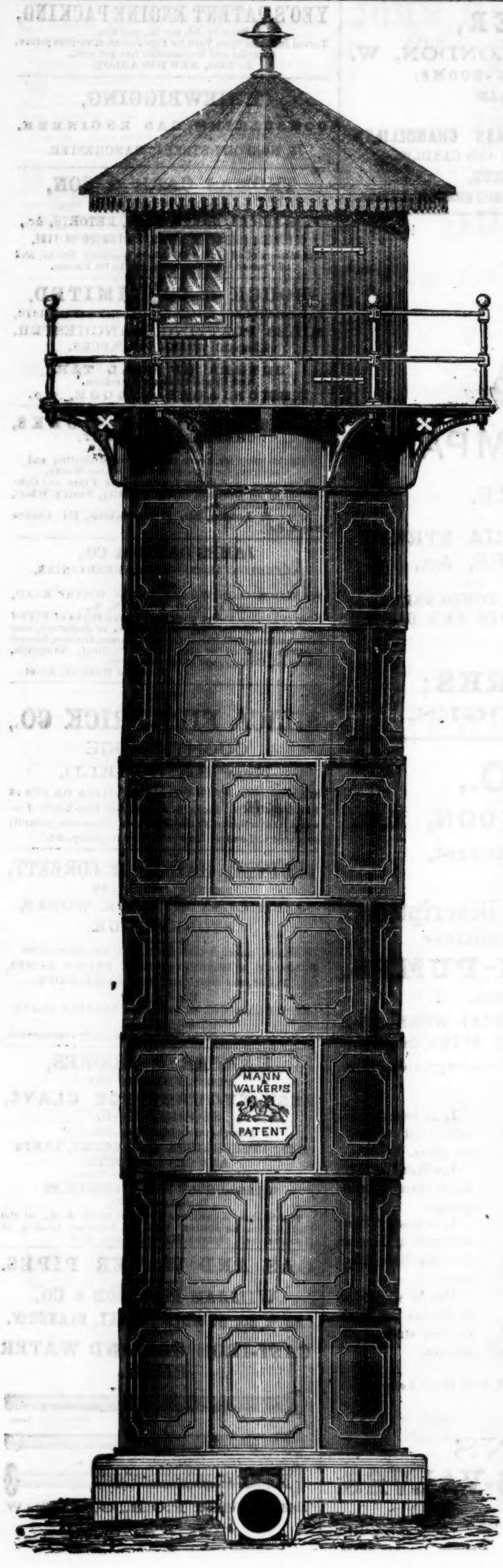
23 & 25, OSWALD STREET, GLASGOW.

CAST-IRON GAS AND WATER PIPES.

DELIVERY F.O.B., GLASGOW

Prices on application.



C. & W. WALKER,
8, FINSBURY CIRCUS,
LONDON, E.C.

MANN & WALKERS' PATENT SCRUBBER.

By Letters Patent in Great Britain, Europe, and the United States of America.

By some important improvements recently patented, the purifying power of these Scrubbers has been much increased, and a stronger ammoniacal solution obtained, which is found to absorb a large portion of the carbonic acid contained in gas, effecting an important saving in money and labour in the lime purifiers, and where oxide only is used, the increase in the illuminating power of the gas obtained by these Scrubbers is shown in a remarkable degree, in consequence of the large quantity of carbonic acid removed from the gas.

It is to be particularly noted that the important results of these Scrubbers do not depend upon the machinery alone. The entire internal construction of the Scrubber bears an almost equally important part. For this reason, where it is desirable to convert existing Scrubbers, whose dimensions happen to be suitable, the work commences by ripping out the whole of the interior of the shell, and beginning the internal construction *de novo* from bottom to top.

Fifty million cubic feet of gas per 24 hours are purified from ammonia by these Patent Scrubbers in a winter's day in the gas-works of London, where the purity of gas supply is the highest in the world, under the chemical restrictions of the Board of Trade.

Generally, wherever a high standard of purification is maintained in the chief cities and towns of the British Provinces and of Europe, these Scrubbers have become established.

By their use the department of purification from ammonia upon a gas-works is made complete, without the aid of prepared oxide of iron, chemicals in purifiers, or any other supplementary process, and the whole ammoniacal residual product contained in the coal is absorbed and obtained in the form most profitable to a gas company, while the requirements of all Acts of Parliament and of the Board of Trade, relating to incorporate gas companies, are satisfied.

Foul Gas, properly condensed, entering the inlet is, by once only passing through the Scrubber, completely purified from ammonia with regular certainty day by day, without any further trouble, or any other process, effected by a very small quantity of clear water let into the machinery room at the top of the Scrubber, which is discharged at the liquor outlet at the bottom, from Newcastle coal at about 18 to 20 ounces strength, from Yorkshire and other coals, generally from 25 to 30 ounces strength; while acidulated litmus or turmeric exposed at the Scrubber outlet will not show the slightest discoloration, and there is not a quarter of a grain of ammonia per 100 feet left unabsorbed.

They contain their own engine power, requiring only a small inappreciable quantity of steam from the gas-works boiler, and are then complete in themselves, ready for service.

Applications relating to dimensions and prices should be addressed to us, C. AND W. WALKER, 8, FINSBURY CIRCUS, LONDON, E.C., or to Mr. WILLIAM MANN, late Superintendent of the Chartered Gas-Works, BLACKFRIARS, LONDON; they should state approximately the largest make of gas in 24 hours on a winter's day, and the smallest make on a summer's day, to be purified.

BRAY'S

"STANDARD"

FLAT-FLAME BURNERS.

(PATENT SLIT UNIONS.)

LIGHTING POWER—40, 50, 60, 70, and 80 CANDLES.

In consequence of the demand for Burners of extra Power for Lighting Large Spaces, we have introduced Burners of the above lighting power, which give from TWELVE to TWENTY per Cent. more light per cubic foot of gas consumed than any Flat-Flame Burner hitherto introduced.

Photometrically, with 16-candle gas, our New Standard Burners yield a result equal to the best Argands of similar consuming power; while, *in actual use*, we are prepared to demonstrate a yield of light 20 per cent. *superior* to the best Argands. With 20-candle gas and upwards, the *photometrical* superiority is greatly in favour of our New Burners.

FOR STREET-LAMP PURPOSES there is no liability of the lamps being filled with carbon by a governor getting out of order, as will be the case where Argands are used; and, as they are lighted in the ordinary way, there is no necessity to keep a small jet burning all day in order to light the Burner at night.

GEORGE BRAY & CO.'S

"ENAMEL" GAS-BURNER WORKS,

BLACKMAN LANE,

LEEDS.

ROBERT MARSHALL,

CANNEL COAL MERCHANT,

198, ST. VINCENT STREET, GLASGOW.

SHOTT'S BOGHEAD.

HARTHILL CANNEL

Yields 14,920 cubic feet of 40·92-candle gas per ton.

THRASHBUSH CANNEL

12,580 cubic feet of 40·22-candle gas per ton, and 9 cwts. of good coke.

LOTHIAN'S CANNEL

Yields 12,500 cubic feet of 34-candle gas per ton, and 9 cwts. of excellent coke, containing only 4 per cent. of ash.

MUIRKIRK, No. 1, CANNEL

Yields 12,160 cubic feet of 32·5-candle gas per ton, and 10 cwts. of excellent coke, containing only 5 per cent. of ash. This cannel is almost free from sulphur.

OLD WEMYSS CANNEL

Yields 13,320 cubic feet of 32·5-candle gas per ton.

Prices and full analyses on application at above address, or from WEDDERSPOON, FERGUSSON AND Co., 21, Lime Street, LONDON, E.C.

GAS COAL.

POPE & PEARSON, LIMITED, have now the authority of several of the most eminent Gas Engineers of London in stating that their Coal yields *in practical working over* 10,000 *cubic feet of gas, with an illuminating power of* 16 *candles;* or by the standard burners now used by the London Gas Companies, an illuminating power equal to 17½ candles.

One ton yields 13½ cwt. of good coke. This Coal can be shipped from Hull, Goole, Liverpool, Morecambe, and Barrow.

For further particulars, apply to POPE AND PEARSON, LIMITED, West Riding and Silkstone Collieries, near LEEDS.

HEBBURN MAIN GAS COALS.

T. Stone, Esq., of Weymouth, writes on Nov. 17, 1876: "I have used about 12,000 tons of this Coal, with, I think, the best possible results, although not always under the most favourable circumstances. My Coal account made up to Midsummer last showed a makeage of 10,594 cubic feet per ton of 14½-candle gas, and not a hundredweight of Cannel used. This statement would, I know, be incredible to many men, and may provoke the remark, 'How much of it is paid for?' For the gratification of such, I have to say that, of the above quantity, 9656 cubic feet per ton of Coal carbonized were brought to charge and duly paid for, with the exception of about 6s. per cent. for bad debts. The coke is of excellent quality. The above facts I hold to be a greater recommendation to your Coal than any words of mine could be."

PRICES ON APPLICATION, EITHER F.O.B. OR BY RAIL IN TRUCK LOADS.

THE TYNE COAL COMPANY, LIMITED, OWNERS.
W. RICHARDSON, Fitter,
29, QUAYSIDE, NEWCASTLE-ON-TYNE.

HOLMSIDE GAS COALS.

South Metropolitan Gaslight and Coke Company,
589, Old Kent Road, London, S.E.,
Oct. 9, 1873.

At the request of Mr. Hedley, the owner of the Holmside Colliery, I have much pleasure in stating that, for about ten or twelve years past, this Company has taken at least half of its supply of Newcastle Coal from him. I can, therefore, confidently bear testimony to the good quality of the Holmside Coals, and consider they are equal to the best of the Newcastle Coals, in proof of which I may state that this year we are using those Coals exclusively, that the yield of Gas is from 9700 to 9800 feet per ton, and that the quality of the Gas, without any admixture of Cannel, is over 16 candles, as tested by the officer appointed by the Metropolitan Board of Works, using the London Gas Referees test.

The Coke is of excellent quality, and in quantity amounts to about 40 bushels from a ton of Coal.

The annual consumption of Coal amounts to about 75,000 tons.

GEORGE LIVESEY, Engineer and Secretary.

P.S.—I am at this date, Feb. 15, 1875, still using Holmside Coals as largely as ever, and am quite as well pleased with them as when I gave the above certificate.

GEORGE LIVESEY.

We are this year, 1878, using 80,000 tons of Holmside Coal. GEORGE LIVESEY.

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AGENT FOR
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Analyses and Quotations on application.

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FUEL-MACHINE, for Compressing Breeze and Tar.

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J. & J. BRADDOCK,
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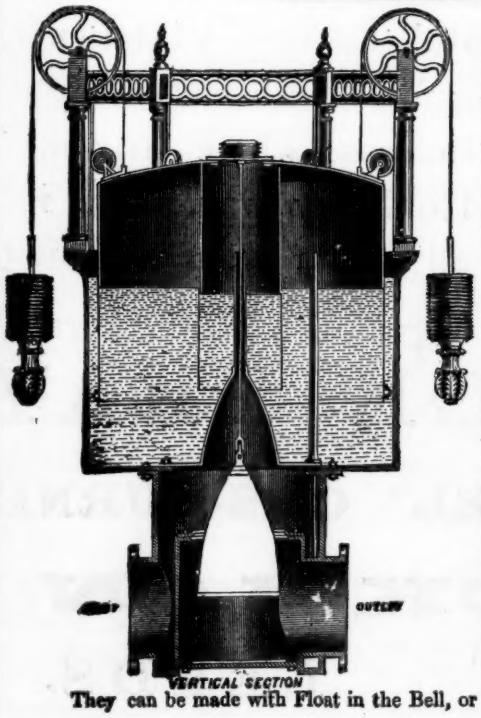
Beg to submit to Gas Engineers their

PATENT COMPENSATING GAS GOVERNOR,

Which is designed to give an uniform pressure at the Outlet to the Main at all draughts up to the full quantities which the Governors are made to control, such outlet pressure being less than the initial pressure.



VERTICAL SECTION

The uniformity of pressure is obtained by introducing a compensating chamber into the Bell or Holder of the Governor, which compensator is of the same area as the valve, both of which are operated on by the initial pressure, thereby placing the valve in equilibrium, no matter what the initial pressure may be. The action on the Bell is by the Gas passing along a pipe from the outlet, and the pressure is regulated by weights in connexion with the Bell as required.

From the sectional elevation attached hereto, it will be seen that only the Gas required to operate the Bell comes in contact with the water of the tank, which water will remain comparatively sweet and free from odour. That in case of accident to the Bell, no more Gas can escape than would pass up the pipe covering the valve-rod and Bell supply-pipe.

These Governors have been made and sent out of various sizes for from 2 to 24-inch Mains, and give most satisfactory results.

They can be made with Float in the Bell, or counterpoise as per section.

THE SILKSTONE & DODWORTH COAL & IRON COMPANY, LIMITED,

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BENJAMIN WHITWORTH, Esq., M.P. . . . . Chairman.
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REAL OLD SILKSTONE GAS COAL.

JAMES PATERSON Esq., Gas Engineer, of the Warrington Gas Company, reported, Aug. 10, 1875:—

"This Coal possesses remarkable qualities as a gas and coking coal, and appears SECOND TO NONE IN THE KINGDOM. It contains the large quantity of 699 lbs. of illuminating matter, and 1498 lbs. of coke to the ton, and produces **12,240** cubic feet of 16·66 candle gas."

The above Company are raising nearly a thousand tons of the Real Old Silkstone Gas Coal per working day.

PRICES QUOTED TO ANY RAILWAY STATION, OR F.O.B. HULL, GRIMSBY, GOOLE, KEADBY, LIVERPOOL, AND FLEETWOOD.

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PARIS EXHIBITION, 1878.

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Being the Highest Honour given for this class.

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SPECIAL NOTICE.—Our Patent Machine-Made Retorts have now been thoroughly tested, and have proved themselves infinitely superior to those made by hand. At several large works it has been settled, beyond question, that, owing to the compactness and general excellence, more gas is sent to the gasholder from each ton of coal carbonized than is the case with hand-made Retorts.

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The various descriptions of Gas Coal produced from the above Collieries possess an unequalled reputation, combining in a large degree the constituents essential for the production of the best quality of Coke and Gas of a high illuminating power.

A recent extensive development of the Collieries enables us to offer increased supplies.

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"*Warrington Gaslight and Coke Company,*
Offices, Mersey Street, Warrington, April 23, 1877.

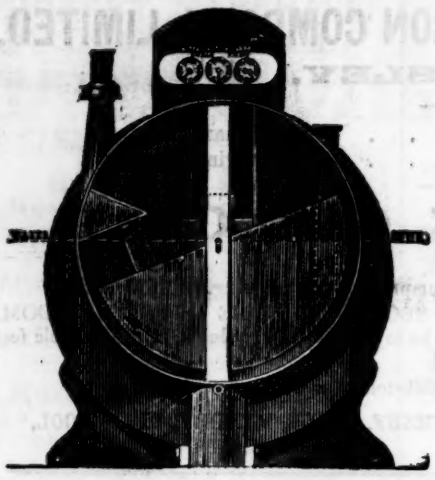
"MESSRS. NEWTON, CHAMBERS, AND CO.,

"GENTLEMEN,—After carefully testing the various samples of Gas Coals sent from your Collieries for analysis, I have pleasure in reporting them as belonging to the highest class of Gas and Coking Coals.

"The average of Nine samples gives a yield of **12,500** cubic feet of **15½**-Candle Gas, being equivalent to **664** lbs. of sperm per ton, and **1420** lbs. of fixed carbon of a very superior quality. All the samples bear a close relation to each other in value.

"Yours truly, "JAMES PATERSON."

Full particulars will be sent on application to us—address as above.



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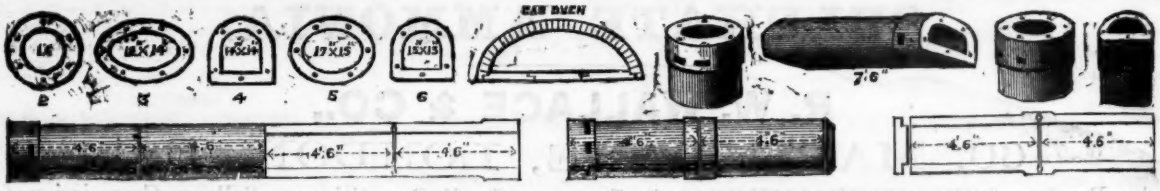

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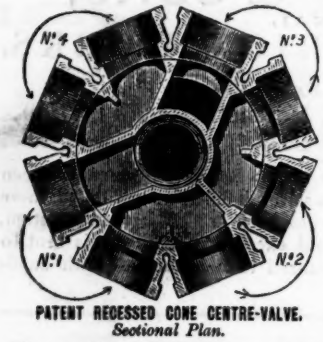

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Sectional Plan.

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Constructed on the principle of the ordinary Plug-Cock.

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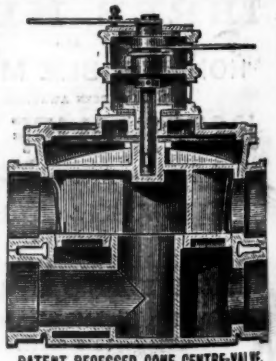

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By the use of which stoppages in service and other pipes are freed from naphthaline and other obstructions in a few minutes. PRICE 73s. net.

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